

=> d his

(FILE 'HOME' ENTERED AT 14:29:29 ON 06 DEC 2006)  
SET COST OFF

FILE 'HCAPLUS' ENTERED AT 14:29:40 ON 06 DEC 2006  
L1 1 S US20020102466/PN OR (US2001-910952# OR KR2000-42737 OR KR2000  
SEL RN

FILE 'REGISTRY' ENTERED AT 14:45:18 ON 06 DEC 2006  
L2 47 S E1-E47  
L3 6 S L2 AND LI/ELS  
L4 1 S LITHIUM/CN  
L5 6 S LI/MF NOT MASS  
L6 12 S L3-L5  
L7 1 S SULFUR/CN  
L8 26 S S/MF NOT MASS  
L9 21 S L8 NOT (34S2 OR E35S2 OR 37S2 OR 33S2 OR MNS/CI)  
L10 21 S L7,L9  
L11 11 S 680-31-9 OR 96-48-0 OR 67-63-0 OR 67-56-1 OR 64-17-5 OR 96-49  
L12 12 S 623-53-0 OR 462-06-6 OR 25496-08-6 OR 78-93-3 OR 110-86-1 OR  
L13 48 S C7H7F/MF AND 46.150.18/RID  
L14 5 S L13 NOT (11C# OR 13C# OR 14C# OR C11# OR C13# OR C14# OR (D O  
L15 16 S L12,L14

FILE 'HCAPLUS' ENTERED AT 14:54:43 ON 06 DEC 2006  
L16 104669 S L6  
L17 3423 S L10 AND L16  
L18 164 S L17 AND L11  
L19 58 S L18 AND L15  
L20 36 S L19 AND (PY<=2001 OR PRY<=2001 OR AY<=2001)  
L21 31 S L19 AND (PY<=2000 OR PRY<=2000 OR AY<=2000)  
L22 5 S L20 NOT L21  
SEL AN DN 1 2 5  
L23 2 S L22 NOT E48-E56  
L24 28 S L21 AND (PD<=20000725 OR PRD<=20000725 OR AD<=20000725)  
L25 3 S L21 NOT L24  
L26 33 S L23-L25  
L27 33 S L1,L26  
L28 5 S L27 AND (HWANG? OR CHOI? OR LEE? OR JUNG? OR KIM?) /AU  
L29 5 S L27 AND SAMSUN?/PA,CS  
L30 5 S L28,L29  
L31 28 S L27 NOT L30

=> fil hcaplus

FILE 'HCAPLUS' ENTERED AT 15:27:55 ON 06 DEC 2006  
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FILE COVERS 1907 - 6 Dec 2006 VOL 145 ISS 24  
 FILE LAST UPDATED: 5 Dec 2006 (20061205/ED)

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This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d 130 bib abs hitstr retable tot

L30 ANSWER 1 OF 5 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2002:964986 HCAPLUS  
 DN 138:15307  
 TI Lithium-sulfur batteries with good cycle life characteristics  
 IN Choi, Soo Seok; Choi, Yunsuk; Jung, Yongju;  
 Lee, Jaewoan; Hwang, Duck Chul; Kim, Joo Soak;  
 Park, Zin; Kim, Seok; Han, Ji Sung  
 PA Samsung SDI Co., Ltd., S. Korea  
 SO U.S. Pat. Appl. Publ., 16 pp.  
 CODEN: USXXCO

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002192557	A1	20021219	US 2002-72907	20020212 <--
	KR 2002092029	A	20021211	KR 2001-30878	20010601 <--
	JP 2002367678	A2	20021220	JP 2002-61349	20020307 <--
	CN 1389948	A	20030108	CN 2002-116133	20020419 <--

PRAI KR 2001-30878 A 20010601 <--

AB A lithium-sulfur battery having a pos. electrode including a pos. active material including an active sulfur, where the pos. electrode comprises an electron-conductive path and an ion-conductive path, and includes active pores of the average size of up to 20  $\mu\text{m}$  having both electron-conductive and ion-conductive properties, and are filled with the active sulfur during an electrochem. reaction of the battery.

IT 7439-93-2, Lithium, uses 7704-34-9, Sulfur, uses

33454-82-9, Lithium triflate

RL: DEV (Device component use); USES (Uses)  
 (lithium-sulfur batteries with good cycle life characteristics)

RN 7439-93-2 HCAPLUS

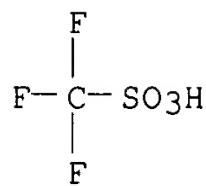
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

RN 7704-34-9 HCAPLUS  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

RN 33454-82-9 HCAPLUS  
 CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)

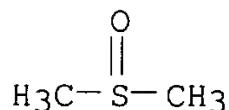


● Li

IT 67-68-5, Dmso, uses 96-48-0, Butyrolactone  
 110-86-1, Pyridine, uses 126-33-0, Sulfolane  
 680-31-9, Hexamethylphosphoramide, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (lithium-sulfur batteries with good cycle life characteristics)

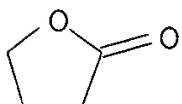
RN 67-68-5 HCPLUS

CN Methane, sulfinylbis- (9CI) (CA INDEX NAME)



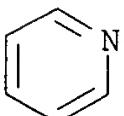
RN 96-48-0 HCPLUS

CN 2(3H)-Furanone, dihydro- (8CI, 9CI) (CA INDEX NAME)



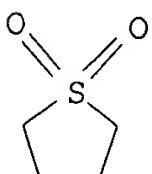
RN 110-86-1 HCPLUS

CN Pyridine (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



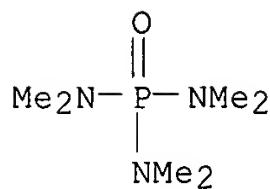
RN 126-33-0 HCPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (8CI, 9CI) (CA INDEX NAME)

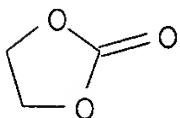


RN 680-31-9 HCPLUS

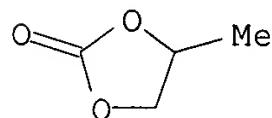
CN Phosphoric triamide, hexamethyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



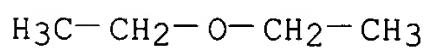
IT   **96-49-1**, Ethylene carbonate 108-32-7, Propylene carbonate  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (plasticizer; lithium-sulfur batteries with good cycle life characteristics)  
 RN   96-49-1   HCAPLUS  
 CN   1,3-Dioxolan-2-one (9CI)   (CA INDEX NAME)



RN   108-32-7   HCAPLUS  
 CN   1,3-Dioxolan-2-one, 4-methyl- (9CI)   (CA INDEX NAME)



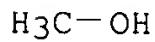
IT   **60-29-7**, Ether, uses **64-17-5**, Ethanol, uses  
**67-56-1**, Methanol, uses **110-82-7**, Cyclohexane, uses  
 RL: DEV (Device component use); USES (Uses)  
 (solvent; lithium-sulfur batteries with good cycle life characteristics)  
 RN   60-29-7   HCAPLUS  
 CN   Ethane, 1,1'-oxybis- (9CI)   (CA INDEX NAME)



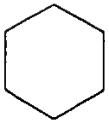
RN   **64-17-5**   HCAPLUS  
 CN   Ethanol (9CI)   (CA INDEX NAME)



RN   **67-56-1**   HCAPLUS  
 CN   Methanol (8CI, 9CI)   (CA INDEX NAME)



RN   **110-82-7**   HCAPLUS  
 CN   Cyclohexane (8CI, 9CI)   (CA INDEX NAME)



L30 ANSWER 2 OF 5 HCPLUS COPYRIGHT 2006 ACS on STN  
 AN 2002:256755 HCPLUS  
 DN 136:282001  
 TI Cathode active material composition for lithium-sulfur battery with good cycle life characteristics  
 IN Hwang, Duck Chul; Choi, Yun Suk; Choi, Soo Seok; Lee, Jea Woan; Jung, Yong Ju; Kim, Joo Soak; Park, Zin  
 PA Samsung Sdi Co., Ltd., S. Korea  
 SO U.S. Pat. Appl. Publ., 9 pp.  
 CODEN: USXXCO

DT Patent  
 LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002039680	A1	20020404	US 2001-931079	20010817 <--
	US 6919143	B2	20050719		
	KR 2002014195	A	20020225	KR 2000-47347	20000817 <--
	KR 2002048447	A	20020624	KR 2000-76694	20001214 <--
	JP 2002110237	A2	20020412	JP 2001-247174	20010816 <--
	CN 1339837	A	20020313	CN 2001-135732	20010817 <--

PRAI KR 2000-47347 A 20000817 <--  
 KR 2000-76694 A 20001214 <--  
 AB A pos. active material composition for a lithium-sulfur battery includes a pos. active material, a conductive agent, an organic mixing solvent to which solubility

of sulfur is equal to or less than 50 mM, and a binder capable of dissolving in the organic mixing solvent.

IT 64-17-5, Ethanol, uses 71-43-2, Benzene, uses 96-48-0,  $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 108-88-3, Toluene, uses 109-60-4, Propyl acetate 110-82-7, Cyclohexane, uses 126-33-0, Sulfolane 462-06-6, Fluorobenzene 623-53-0, Ethylmethyl carbonate 7704-34-9D, Sulfur, organic compound 7791-03-9, Lithium perchlorate 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 33454-82-9, Lithium triflate 90076-65-6

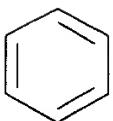
RL: DEV (Device component use); USES (Uses)  
 (cathode active material composition for lithium-sulfur battery with good cycle life characteristics)

RN 64-17-5 HCPLUS

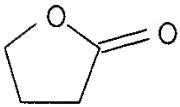
CN Ethanol (9CI) (CA INDEX NAME)

H<sub>3</sub>C—CH<sub>2</sub>—OH

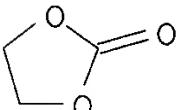
RN 71-43-2 HCPLUS  
 CN Benzene (8CI, 9CI) (CA INDEX NAME)



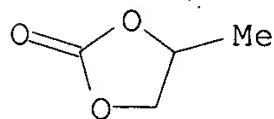
RN 96-48-0 HCAPLUS  
 CN 2(3H)-Furanone, dihydro- (8CI, 9CI) (CA INDEX NAME)



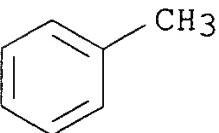
RN 96-49-1 HCAPLUS  
 CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



RN 108-32-7 HCAPLUS  
 CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



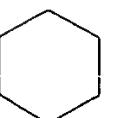
RN 108-88-3 HCAPLUS  
 CN Benzene, methyl- (9CI) (CA INDEX NAME)



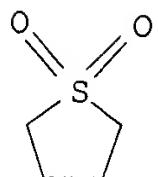
RN 109-60-4 HCAPLUS  
 CN Acetic acid, propyl ester (6CI, 8CI, 9CI) (CA INDEX NAME)

n-Pr-O-Ac

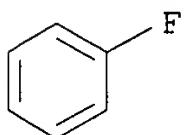
RN 110-82-7 HCAPLUS  
 CN Cyclohexane (8CI, 9CI) (CA INDEX NAME)



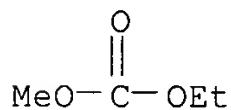
RN 126-33-0 HCAPLUS  
 CN Thiophene, tetrahydro-, 1,1-dioxide (8CI, 9CI) (CA INDEX NAME)



RN 462-06-6 HCAPLUS  
 CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



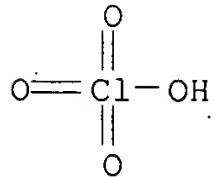
RN 623-53-0 HCAPLUS  
 CN Carbonic acid, ethyl methyl ester (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 7704-34-9 HCAPLUS  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

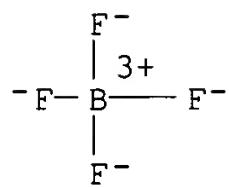
S

RN 7791-03-9 HCAPLUS  
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



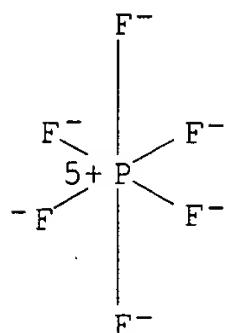
● Li

RN 14283-07-9 HCAPLUS  
 CN Borate(1-), tetrafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)



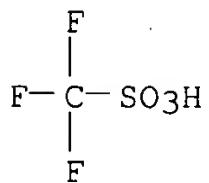
●  $\text{Li}^+$

RN 21324-40-3 HCAPLUS  
 CN Phosphate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)



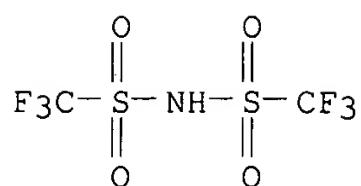
●  $\text{Li}^+$

RN 33454-82-9 HCAPLUS  
 CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

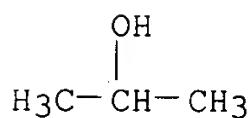
RN 90076-65-6 HCAPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[ (trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



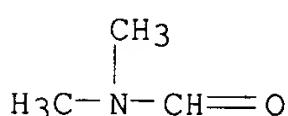
● Li

IT 67-63-0, Isopropyl alcohol, uses 68-12-2, Dmf, uses  
 75-05-8, Acetonitrile, uses  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (cathode active material composition for lithium-sulfur battery with good  
 cycle life characteristics)

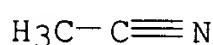
RN 67-63-0 HCAPLUS  
 CN 2-Propanol (9CI) (CA INDEX NAME)



RN 68-12-2 HCAPLUS  
 CN Formamide, N,N-dimethyl- (8CI, 9CI) (CA INDEX NAME)



RN 75-05-8 HCAPLUS  
 CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



#### RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	2000			CN 1271968 A	HCAPLUS
Carlson	2002			US 6488721 B1	HCAPLUS
Chu	1998			US 5814420 A	HCAPLUS
Chu	2000			US 6030720 A	HCAPLUS
Geronov	2002			US 6344293 B1	HCAPLUS
Igarashi	2003			US 6573004 B1	HCAPLUS
Nakagiri	2003			US 6576370 B1	HCAPLUS
Semel	1994			US 5298055 A	HCAPLUS
Takezawa	2004			US 6733927 B1	HCAPLUS

L30 ANSWER 3 OF 5 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2002:103441 HCAPLUS  
 DN 136:153869  
 TI Lithium-sulfur batteries with high capacity and good rate capability

IN Jung, Yongju; Kim, Seok; Choi, Yunsuk;  
 Choi, Soo Seok; Lee, Jeawoan; Hwang, Duck Chul  
 ; Kim, Joo Soak

PA Samsung SDI Co., Ltd., S. Korea

SO Eur. Pat. Appl., 10 pp.

CODEN: EPXXDW

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1178555	A2	20020206	EP 2001-117788	20010802 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	KR 2002011562	A	20020209	KR 2000-44900	20000802 <--
	KR 2002011563	A	20020209	KR 2000-44901	20000802 <--
	JP 2002075446	A2	20020315	JP 2001-213286	20010713 <--
	US 2002045102	A1	20020418	US 2001-918463	20010801 <--
	CN 1336696	A	20020220	CN 2001-132527	20010802 <--

PRAI KR 2000-44900 A 20000802 <--  
 KR 2000-44901 A 20000802 <--

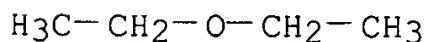
AB A lithium-sulfur battery includes a neg. electrode, a pos. electrode, and an electrolyte. The neg. electrode includes a neg. active material selected from materials in which lithium intercalation reversibly occur, lithium alloy or lithium metal. The pos. electrode includes at least one of elemental sulfur and organosulfur compds. for a pos. active material, and an elec. conductive material. The electrolyte includes at least two groups selected from a weak polar solvent group, a strong polar solvent group and a lithium protection solvent group, where the electrolyte includes at least one or more solvents selected from the same group. The electrolyte may optionally include one or more electrolyte salts.

IT 60-29-7, Diethyl ether, uses 67-68-5, DMSO, uses  
 68-12-2, DMF, uses 75-05-8, Acetonitrile, uses  
 96-48-0,  $\gamma$ -Butyrolactone 108-88-3, Toluene, uses  
 123-91-1, 1,4-Dioxane, uses 126-33-0, Sulfolane  
 680-31-9, Hexamethyl phosphoric triamide, uses 7439-93-2  
 , Lithium, uses 7704-34-9, Sulfur, uses 7704-34-9D,  
 Sulfur, organic compound 7791-03-9, Lithium perchlorate  
 14283-07-9, Lithium tetrafluoroborate 21324-40-3,  
 Lithium hexafluorophosphate 33454-82-9, Lithium triflate  
 90076-65-6

RL: DEV (Device component use); USES (Uses)  
 (lithium-sulfur batteries with high capacity and good rate capability)

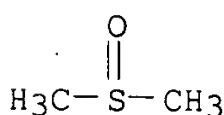
RN 60-29-7 HCPLUS

CN Ethane, 1,1'-oxybis- (9CI) (CA INDEX NAME)



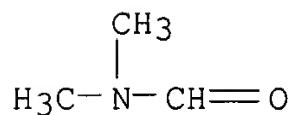
RN 67-68-5 HCPLUS

CN Methane, sulfinylbis- (9CI) (CA INDEX NAME)

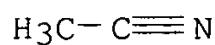


RN 68-12-2 HCPLUS

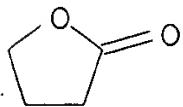
CN Formamide, N,N-dimethyl- (8CI, 9CI) (CA INDEX NAME)



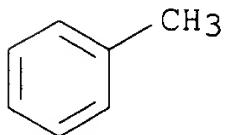
RN 75-05-8 HCPLUS  
 CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



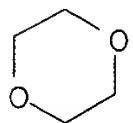
RN 96-48-0 HCPLUS  
 CN 2(3H)-Furanone, dihydro- (8CI, 9CI) (CA INDEX NAME)



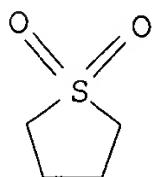
RN 108-88-3 HCPLUS  
 CN Benzene, methyl- (9CI) (CA INDEX NAME)



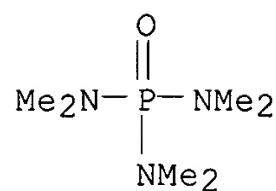
RN 123-91-1 HCPLUS  
 CN 1,4-Dioxane (9CI) (CA INDEX NAME)



RN 126-33-0 HCPLUS  
 CN Thiophene, tetrahydro-, 1,1-dioxide (8CI, 9CI) (CA INDEX NAME)



RN 680-31-9 HCPLUS  
 CN Phosphoric triamide, hexamethyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 7439-93-2 HCPLUS  
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

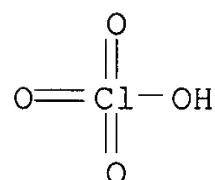
RN 7704-34-9 HCPLUS  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

RN 7704-34-9 HCPLUS  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

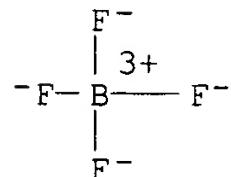
S

RN 7791-03-9 HCPLUS  
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



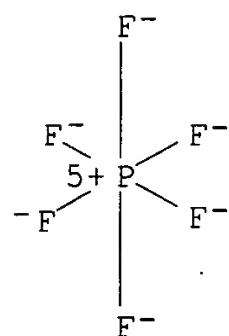
● Li

RN 14283-07-9 HCPLUS  
 CN Borate(1-), tetrafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)



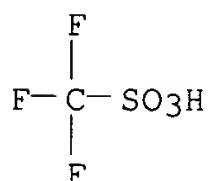
●  $\text{Li}^+$

RN 21324-40-3 HCPLUS  
 CN Phosphate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)



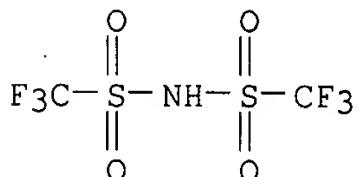
● Li<sup>+</sup>

RN 33454-82-9 HCPLUS  
 CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 90076-65-6 HCPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[ (trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



● Li

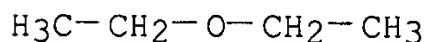
L30 ANSWER 4 OF 5 HCPLUS COPYRIGHT 2006 ACS on STN  
 AN 2002:84081 HCPLUS  
 DN 136:137403  
 TI Electrolyte for a lithium-sulfur battery  
 IN Hwang, Duckchul; Choi, Yunsuk; Choi, Sooseok  
 ; Lee, Jeawoan; Jung, Yongju; Kim, Joosoak  
 PA Samsung SDI Co. Ltd., S. Korea  
 SO Eur. Pat. Appl., 7 pp.

DT CODEN: EPXXDW

LA English

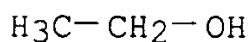
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1176659	A2	20020130	EP 2001-117661	20010725 <--
	EP 1176659	A3	20060531		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
	KR 2002008704	A	20020131	KR 2000-42736	20000725 <--
	KR 2002008705	A	20020131	KR 2000-42737	20000725 <--
	JP 2002075447	A2	20020315	JP 2001-213435	20010713 <--
	US 2002102466	A1	<u>20020801</u>	US 2001- <u>910952</u>	20010724 <--
	CN 1335653	A	20020213	CN 2001-132526	20010725 <--
	PRAI	KR 2000-42736	A	20000725 <--	
		KR 2000-42737	A	20000725 <--	
AB	An electrolyte for a lithium-sulfur battery has a solvent having a dielec. constant that is greater than or equal to 20, a solvent having a viscosity that is less than or equal to 1.3, and an electrolyte salt. This battery shows excellent capacity and cycle life characteristics..				
IT	60-29-7, Ethyl ether, uses 64-17-5, Ethanol, uses 67-56-1, Methanol, uses 67-63-0, Isopropanol, uses 67-68-5, Dmso, uses 68-12-2, Dmf, uses 71-43-2 , Benzene, uses 75-05-8, Acetonitrile, uses 78-93-3, Methylethyl ketone, uses 96-48-0, $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 107-31-3, Methyl formate 108-32-7, Propylene carbonate 109-60-4, n-Propyl acetate 110-82-7, Cyclohexane, uses 110-86-1, Pyridine, uses 123-91-1, p-Dioxane, uses 126-33-0, Sulfolane 462-06-6, Fluorobenzene 623-53-0, Ethylmethyl carbonate 680-31-9, Hexamethylphosphoramide, uses 7704-34-9, Sulfur, uses 7791-03-9, Lithium perchlorate 14283-07-9 , Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 25496-08-6, Fluorotoluene 29935-35-1 , Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 90076-65-6				
	RL: DEV (Device component use); USES (Uses) (electrolyte for lithium-sulfur battery)				
RN	60-29-7 HCPLUS				
CN	Ethane, 1,1'-oxybis- (9CI) (CA INDEX NAME)				



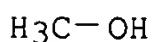
RN 64-17-5 HCPLUS

CN Ethanol (9CI) (CA INDEX NAME)

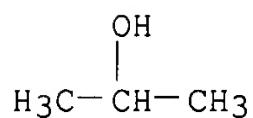


RN 67-56-1 HCPLUS

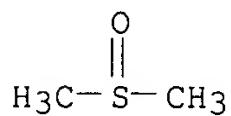
CN Methanol (8CI, 9CI) (CA INDEX NAME)



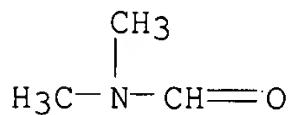
RN 67-63-0 HCPLUS  
 CN 2-Propanol (9CI) (CA INDEX NAME)



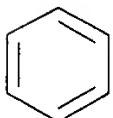
RN 67-68-5 HCPLUS  
 CN Methane, sulfinylbis- (9CI) (CA INDEX NAME)



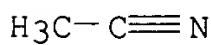
RN 68-12-2 HCPLUS  
 CN Formamide, N,N-dimethyl- (8CI, 9CI) (CA INDEX NAME)



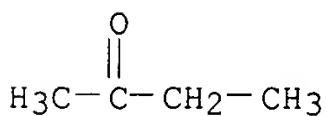
RN 71-43-2 HCPLUS  
 CN Benzene (8CI, 9CI) (CA INDEX NAME)



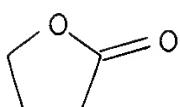
RN 75-05-8 HCPLUS  
 CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



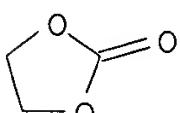
RN 78-93-3 HCPLUS  
 CN 2-Butanone (8CI, 9CI) (CA INDEX NAME)



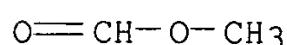
RN 96-48-0 HCPLUS  
 CN 2(3H)-Furanone, dihydro- (8CI, 9CI) (CA INDEX NAME)



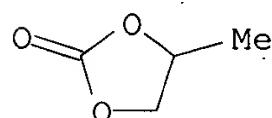
RN 96-49-1 HCPLUS  
 CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



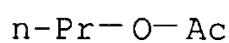
RN 107-31-3 HCPLUS  
 CN Formic acid, methyl ester (6CI, 8CI, 9CI) (CA INDEX NAME)



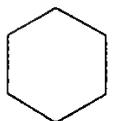
RN 108-32-7 HCPLUS  
 CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



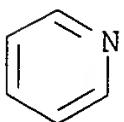
RN 109-60-4 HCPLUS  
 CN Acetic acid, propyl ester (6CI, 8CI, 9CI) (CA INDEX NAME)



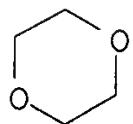
RN 110-82-7 HCPLUS  
 CN Cyclohexane (8CI, 9CI) (CA INDEX NAME)



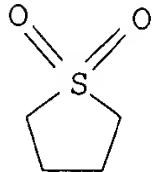
RN 110-86-1 HCPLUS  
 CN Pyridine (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



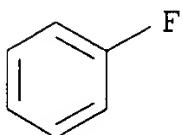
RN 123-91-1 HCPLUS  
 CN 1,4-Dioxane (9CI) (CA INDEX NAME)



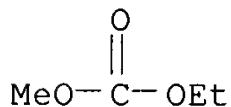
RN 126-33-0 HCPLUS  
 CN Thiophene, tetrahydro-, 1,1-dioxide (8CI, 9CI) (CA INDEX NAME)



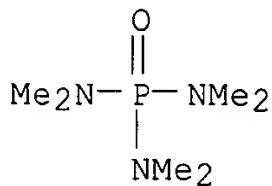
RN 462-06-6 HCPLUS  
 CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



RN 623-53-0 HCPLUS  
 CN Carbonic acid, ethyl methyl ester (7CI, 8CI, 9CI) (CA INDEX NAME)



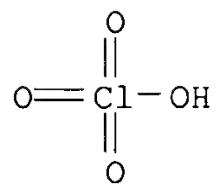
RN 680-31-9 HCPLUS  
 CN Phosphoric triamide, hexamethyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 7704-34-9 HCPLUS  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

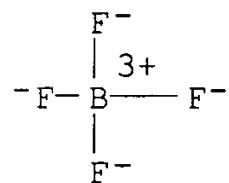
S

RN 7791-03-9 HCPLUS  
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)

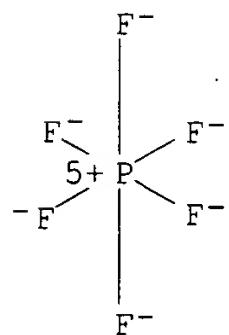


## ● Li

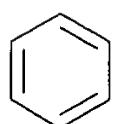
RN 14283-07-9 HCPLUS  
 CN Borate(1-), tetrafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)

● Li<sup>+</sup>

RN 21324-40-3 HCPLUS  
 CN Phosphate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)

● Li<sup>+</sup>

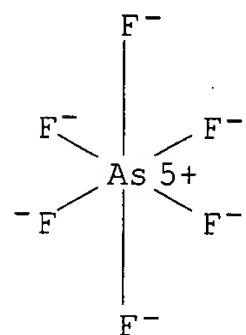
RN 25496-08-6 HCPLUS  
 CN Benzene, fluoromethyl- (9CI) (CA INDEX NAME)



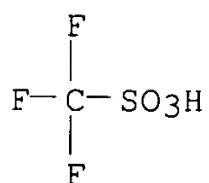
D1-F

D1-Me

RN 29935-35-1 HCPLUS  
 CN Arsenate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)

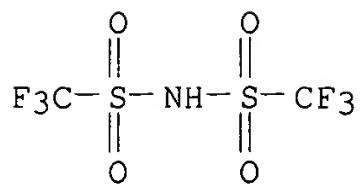
● Li<sup>+</sup>

RN 33454-82-9 HCPLUS  
 CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 90076-65-6 HCPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[ (trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



● Li

L30 ANSWER 5 OF 5 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 2002:84080 HCAPLUS

DN 136:137402

TI Electrolyte for a lithium-sulfur battery

IN Hwang, Duckchul; Choi, Yunsuk; Choi, Sooseok  
; Lee, Jeawoan; Jung, Yongju; Kim, Joosoak

PA Samsung SDI Co. Ltd., S. Korea

SO Eur. Pat. Appl., 11 pp.

CODEN: EPXXDW

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1176658	A2	20020130	EP 2001-117642	20010724 <--
	EP 1176658	A3	20060531		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
	KR 2002008703	A	20020131	KR 2000-42735	20000725 <--
	KR 2002014196	A	20020225	KR 2000-47348	20000817 <--
	JP 2002083633	A2	20020322	JP 2001-213414	20010713 <--
	US 2002045101	A1	20020418	US 2001-911083	20010724 <--
	US 6852450	B2	20050208		
	CN 1335652	A	20020213	CN 2001-132525	20010725 <--
PRAI	KR 2000-42735	A	20000725 <--		
	KR 2000-47348	A	20000817 <--		

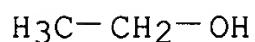
AB An electrolyte for a lithium-sulfur battery includes a first component solvent with a sulfur solubility more than or equal to 20 mM, a second component solvent with a sulfur solubility less than 20 mM, a third component solvent with a high dielec. constant and a high viscosity, and an electrolyte salt. This battery shows excellent capacity and cycle life characteristics.

IT 64-17-5, Ethanol, uses 67-63-0, Isopropanol, uses  
71-43-2, Benzene, uses 96-48-0,  $\gamma$ -Butyrolactone  
96-49-1, Ethylene carbonate 108-32-7, Propylene  
carbonate 108-88-3, Toluene, uses 109-60-4, Propyl  
acetate 110-82-7, Cyclohexane, uses 126-33-0,  
Sulfolane 462-06-6, Fluorobenzene 623-53-0,  
Ethylmethyl carbonate 7439-93-2, Lithium, uses 7704-34-9  
, Sulfur, uses 7704-34-9D, Sulfur, organic compound 7791-03-9  
, Lithium perchlorate 14283-07-9, Lithium tetrafluoroborate  
21324-40-3, Lithium hexafluorophosphate 29935-35-1,  
Lithium hexafluoroarsenate 33454-82-9, Lithium triflate  
90076-65-6

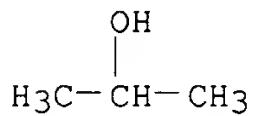
RL: DEV (Device component use); USES (Uses)  
(electrolyte for lithium-sulfur battery)

RN 64-17-5 HCAPLUS

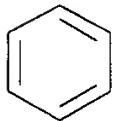
- CN Ethanol (9CI) (CA INDEX NAME)



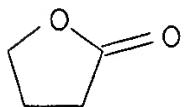
RN 67-63-0 HCPLUS  
 CN 2-Propanol (9CI) (CA INDEX NAME)



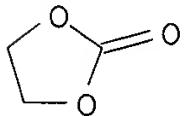
RN 71-43-2 HCPLUS  
 CN Benzene (8CI, 9CI) (CA INDEX NAME)



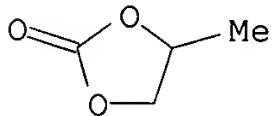
RN 96-48-0 HCPLUS  
 CN 2(3H)-Furanone, dihydro- (8CI, 9CI) (CA INDEX NAME)



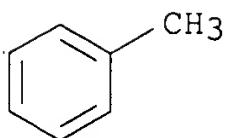
RN 96-49-1 HCPLUS  
 CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



RN 108-32-7 HCPLUS  
 CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



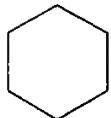
RN 108-88-3 HCPLUS  
 CN Benzene, methyl- (9CI) (CA INDEX NAME)



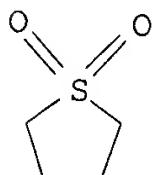
RN 109-60-4 HCPLUS  
 CN Acetic acid, propyl ester (6CI, 8CI, 9CI) (CA INDEX NAME)

n-Pr-O-Ac

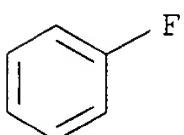
RN 110-82-7 HCPLUS  
 CN Cyclohexane (8CI, 9CI) (CA INDEX NAME)



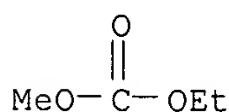
RN 126-33-0 HCPLUS  
 CN Thiophene, tetrahydro-, 1,1-dioxide (8CI, 9CI) (CA INDEX NAME)



RN 462-06-6 HCPLUS  
 CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



RN 623-53-0 HCPLUS  
 CN Carbonic acid, ethyl methyl ester (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 7439-93-2 HCPLUS  
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

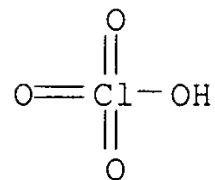
RN 7704-34-9 HCPLUS  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

RN 7704-34-9 HCPLUS  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

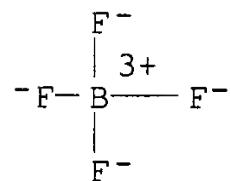
S

RN 7791-03-9 HCPLUS  
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)

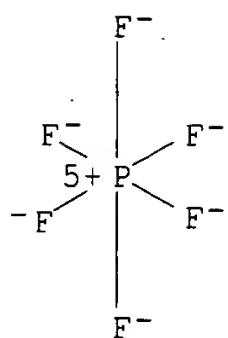


● Li

RN 14283-07-9 HCPLUS  
 CN Borate(1-), tetrafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)

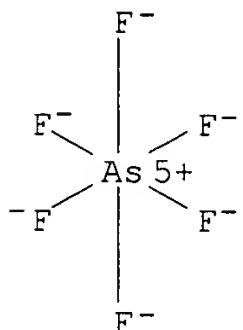
●  $\text{Li}^+$ 

RN 21324-40-3 HCPLUS  
 CN Phosphate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)



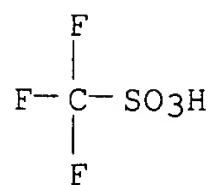
● Li<sup>+</sup>

RN 29935-35-1 HCAPLUS  
 CN Arsenate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)



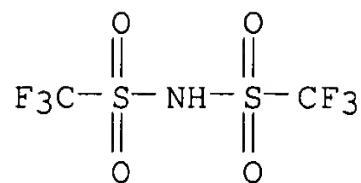
● Li<sup>+</sup>

RN 33454-82-9 HCAPLUS  
 CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 90076-65-6 HCAPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



● Li

=> d 131 bib abs hitstr retable tot

L31 ANSWER 2 OF 28 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2002:658414 HCAPLUS .  
 DN 137:188262  
 TI Electrolytes with strong oxidizing additives for lithium/sulfur batteries  
 IN Chu, May-Ying; Nimon, Yevgeniy S.; Visco, Steven J.  
 PA Polyplus Battery Company, USA  
 SO PCT Int. Appl., 54 pp.

CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002067344	A2	20020829	WO 2002-US4274	20020213 <--
	WO 2002067344	A3	20050203		
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
	US 6632573	B1	20031014	US 2001-789379	20010220 <--
	AU 2002306483	A1	20020904	AU 2002-306483	20020213 <--
	US 2004081894	A1	20040429	US 2003-645193	20030820 <--
PRAI	US 2001-789379	A	20010220 <--		
	WO 2002-US4274	W	20020213		

OS MARPAT 137:188262

AB Disclosed are oxidizer-treated lithium electrodes, battery cells containing such oxidizer-treated lithium electrodes, battery cell electrolytes containing oxidizing additives, and methods of treating lithium electrodes with oxidizing agents and battery cells containing such oxidizer-treated lithium electrodes. Battery cells containing SO<sub>2</sub> as an electrolyte additive in accordance with the present invention exhibit higher discharge capacities after cell storage over cells not containing SO<sub>2</sub>. Pre-treating the lithium electrode with SO<sub>2</sub> gas prior to battery assembly prevented cell polarization. Moreover, the SO<sub>2</sub> treatment does not neg. impact sulfur utilization and improves the lithium's electrochem. function as the neg. electrode in the battery cell.

IT 67-68-5, Dmso, uses 68-12-2, Dmf, uses 110-86-1

2nd

weiner - 09 / 910952

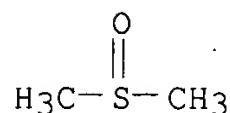
Page 26

, Pyridine, uses 680-31-9, Hexamethylphosphoramide, uses  
7439-93-2, Lithium, uses 7439-93-2D, Lithium,  
intercalation compound 7704-34-9, Sulfur, uses 7704-34-9D  
, Sulfur, organic compound 7791-03-9, Lithium perchlorate  
14283-07-9, Lithium tetrafluoroborate 21324-40-3,  
Lithium hexafluorophosphate 29935-35-1, Lithium  
hexafluoroarsenate 33454-82-9, Lithium triflate  
90076-65-6

RL: DEV (Device component use); USES (Uses)  
(electrolytes with strong oxidizing additives for lithium/sulfur  
batteries)

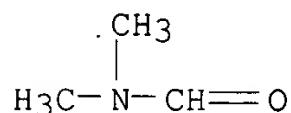
RN 67-68-5 HCPLUS

CN Methane, sulfinylbis- (9CI) (CA INDEX NAME)



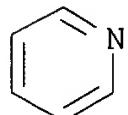
RN 68-12-2 HCPLUS

CN Formamide, N,N-dimethyl- (8CI, 9CI) (CA INDEX NAME)



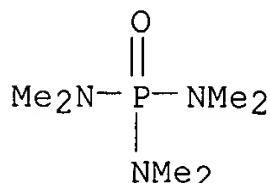
RN 110-86-1 HCPLUS

CN Pyridine (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



RN 680-31-9 HCPLUS

CN Phosphoric triamide, hexamethyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 7439-93-2 HCPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

RN 7439-93-2 HCPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

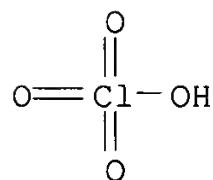
RN 7704-34-9 HCPLUS  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

RN 7704-34-9 HCPLUS  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

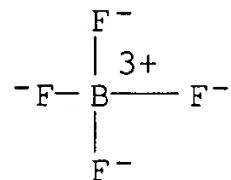
S

RN 7791-03-9 HCPLUS  
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)

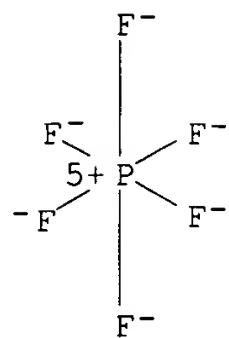


● Li

RN 14283-07-9 HCPLUS  
 CN Borate(1-), tetrafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)

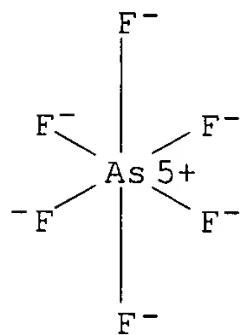
●  $\text{Li}^+$ 

RN 21324-40-3 HCPLUS  
 CN Phosphate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)



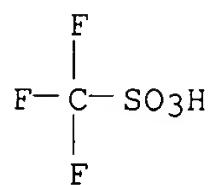
● Li<sup>+</sup>

RN 29935-35-1 HCPLUS  
 CN Arsenate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)



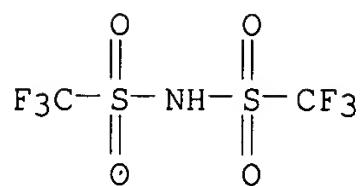
● Li<sup>+</sup>

RN 33454-82-9 HCPLUS  
 CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 90076-65-6 HCPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[ (trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



● Li

L31 ANSWER 3 OF 28 HCPLUS COPYRIGHT 2006 ACS on STN

AN 2002:444410 HCPLUS

DN 137:8649

TI Cathode current collector for electrochemical cells

IN Roach, Joseph M.

PA Moltech Corporation, USA

SO U.S., 11 pp.

CODEN: USXXAM

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6403263	B1	20020611	US 2000-668706	<u>20000920 &lt;--</u>
PRAI	US 2000-668706		20000920 <--		

AB Provided are cathode current collectors for use in electrochem. cells, wherein the current collector comprises a conductive primer layer applied upon a conductive support, and the primer layer comprises from about 25 to 70% by weight of a crosslinked polymeric material formed from a reaction of a polyvinyl acetal and a crosslinking agent, and about 30 to 75% by weight of a conductive filler. The present invention also pertains to methods of forming such cathode current collectors for use in electrochem. cells comprising (i) an anode comprising lithium, and (ii) a cathode comprising an electroactive sulfur-containing material.

IT 7439-93-2, Lithium, uses 7704-34-9, Sulfur, uses

RL: DEV (Device component use); USES (Uses)  
(cathode current collector for electrochem. cells)

RN 7439-93-2 HCPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

RN 7704-34-9 HCPLUS

CN Sulfur (8CI, 9CI) (CA INDEX NAME)

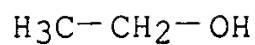
S

IT 64-17-5, Ethanol, uses 78-93-3, Ethyl methyl ketone,  
uses

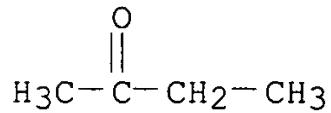
RL: TEM (Technical or engineered material use); USES (Uses)  
(cathode current collector for electrochem. cells)

RN 64-17-5 HCPLUS

CN Ethanol (9CI) (CA INDEX NAME)



RN 78-93-3 HCAPLUS  
 CN 2-Butanone (8CI, 9CI) (CA INDEX NAME)



## RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Alamgir	1994		93	Lithium Batteries, N	HCAPLUS
Anon	1999			WO 9933125	HCAPLUS
Anon	2000			WO 0036674	HCAPLUS
Anon	2000			WO 0036678	HCAPLUS
Armand	1988			US 4739018 A	HCAPLUS
Bagley	1993			US 5194341 A	HCAPLUS
Carlson	2000			US 6153337 A	HCAPLUS
Chaloner-Gill	1995			US 5399447 A	HCAPLUS
Chaloner-Gill	1996			US 5520850 A	HCAPLUS
Chassar	2000			US 6069221 A	HCAPLUS
de Jonghe	1989			US 4833048 A	HCAPLUS
de Jonghe	1990			US 4917974 A	HCAPLUS
Dominey	1994		137	Lithium Batteries, N	HCAPLUS
Fauteux	1996			US 5578396 A	
Fauteux	1996			US 5588971 A	
Fauteux	1997			US 5591544 A	
Gorkovenko	2001			US 6201100 B1	HCAPLUS
Lee	1996			US 5538812 A	HCAPLUS
McEwen	1999			US 5973913 A	HCAPLUS
Moulton,	1995			US 5441830 A	HCAPLUS
Moulton	1995			US 5464707 A	HCAPLUS
Naoi	1998			US 5723230 A	HCAPLUS
Naoi	1998			US 5783330 A	HCAPLUS
Naoi	1998			US 5792575 A	HCAPLUS
Naoi	1999			US 5882819 A	HCAPLUS
Olsen	1996			US 5518839 A	HCAPLUS
Oyama	1994			US 5324599 A	HCAPLUS
Perichaud	1987			US 4664991 A	HCAPLUS
Skotheim	1996			US 5529860 A	HCAPLUS
Skotheim	1997			US 5601947 A	HCAPLUS
Skotheim	1997			US 5690702 A	HCAPLUS
Skotheim	2000			US 6117590 A	HCAPLUS
Spillman	1999			US 5935724 A	HCAPLUS
Spillman	1999			US 5935728 A	HCAPLUS
Touhsaent	1998			US 5827615 A	HCAPLUS
Tsukahara	2000			US 6048637 A	
Turi	1995			US 5478676 A	HCAPLUS
Visco	1992			US 5162175 A	HCAPLUS
Visco	1996			US 5516598 A	HCAPLUS
Xu	2001			US 6302928 B1	HCAPLUS

AN 2002:66770 HCPLUS  
 DN 136:121064  
 TI Nonaqueous electrolyte lithium secondary battery  
 IN Iwamoto, Kazuyu; Oura, Takafumi; Hatazaki, Makino; Yoshizawa, Hiroshi;  
 Sonoda, Kumiko; Nakanishi, Shinji  
 PA Matsushita Electric Industrial Co., Ltd., Japan  
 SO Eur. Pat. Appl., 31 pp.  
 CODEN: EPXXDW

DT Patent  
 LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1174940	A1	20020123	EP 2001-117048	20010712 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2002033119	A2	20020131	JP 2000-215518	20000717 <--
	JP 2002033120	A2	20020131	JP 2000-215519	20000717 <--
	JP 2002033124	A2	20020131	JP 2000-215520	20000717 <--
	US 2002039677	A1	20020404	US 2001-901130	<u>20010710</u> <--
	US 6958198	B2	20051025		
	CN 1333580	A	20020130	CN 2001-123135	20010717 <--
PRAI	JP 2000-215518	A	20000717	<--	
	JP 2000-215519	A	20000717	<--	
	JP 2000-215520	A	20000717	<--	

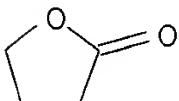
AB The invention relates to a nonaq. electrochem. apparatus in which the difference ( $\gamma_1 - \gamma_{se}$ ) between the surface tension  $\gamma_1$  of nonaq. electrolyte and the surface free energy  $\gamma_{se}$  of electrode is not more than 10 dynes/cm. The nonaq. electrolyte contains a F-containing surface active agent.

IT 96-48-0,  $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 109-60-4,  $\gamma$ -Propyl acetate 623-53-0, Ethylmethyl carbonate 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 90076-65-6

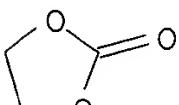
RL: DEV (Device component use); USES (Uses)  
 (nonaq. electrolyte lithium secondary battery)

RN 96-48-0 HCPLUS

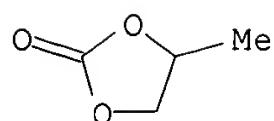
CN 2(3H)-Furanone, dihydro- (8CI, 9CI) (CA INDEX NAME)



RN 96-49-1 HCPLUS  
 CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



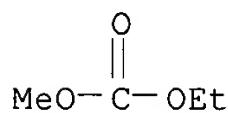
RN 108-32-7 HCPLUS  
 CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



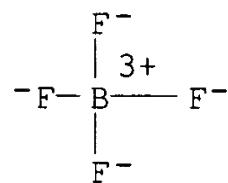
RN 109-60-4 HCAPLUS  
 CN Acetic acid, propyl ester (6CI, 8CI, 9CI) (CA INDEX NAME)

n-Pr-O-Ac

RN 623-53-0 HCAPLUS  
 CN Carbonic acid, ethyl methyl ester (7CI, 8CI, 9CI) (CA INDEX NAME)

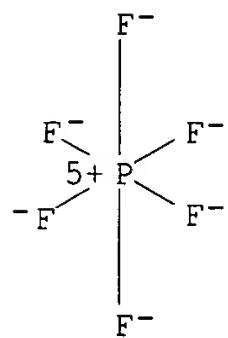


RN 14283-07-9 HCAPLUS  
 CN Borate(1-), tetrafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)



●  $Li^+$

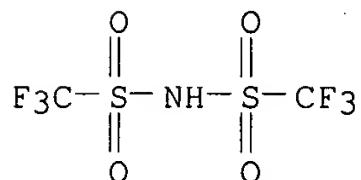
RN 21324-40-3 HCAPLUS  
 CN Phosphate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)



●  $Li^+$

RN 90076-65-6 HCAPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-,

lithium salt (9CI) (CA INDEX NAME)

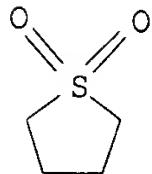


● Li

IT 126-33-0, Sulfolane 7704-34-9D, Sulfur, ester  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (nonaq. electrolyte lithium secondary battery)

RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (8CI, 9CI) (CA INDEX NAME)



RN 7704-34-9 HCAPLUS

CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

## RETABLE

Referenced Author (RAU)	Year (R PY)	VOL (R VL)	PG (R PG)	Referenced Work (RWK)	Referenced File
Anon	1992	016	P-1450	PATENT ABSTRACTS OF	
Anon	1996	1996		PATENT ABSTRACTS OF	
Anon	1997	1997		PATENT ABSTRACTS OF	
Anon	1997	1997		PATENT ABSTRACTS OF	
Anon	1997	1997		PATENT ABSTRACTS OF	
Anon	1998	1998		PATENT ABSTRACTS OF	
Anon	2000	2000		PATENT ABSTRACTS OF	
Anon	2000	2000		PATENT ABSTRACTS OF	
Anon	2001	2000		PATENT ABSTRACTS OF	
Asahi Chem Ind Co Ltd	1997			JP 09106834 A	H CAPLUS
Brodd, R	1994			US 5358801 A	H CAPLUS
Buerge	1999			WO 9916138 A	H CAPLUS
Centre Nat Etd Spatiale	1994			FR 2704099 A	H CAPLUS
Denso Corp	1999			JP 11354104 A	H CAPLUS
Hitachi Ltd	1997			JP 09092280 A	H CAPLUS
Japan Storage Battery C	2001			JP 2001060464 A	H CAPLUS
Matsushita Electric Ind	1991			EP 0457354 A	H CAPLUS
Minnesota Mining & Mfg	1999			WO 9930381 A	H CAPLUS
Sanyo Electric Co Ltd	1997			JP 09161844 A	H CAPLUS
Sanyo Electric Co.Ltd	1997			JP 09306539 A	H CAPLUS
Shin Kobe Electric Mach	2000			JP 2000082471 A	H CAPLUS

Sony Corp	1995	JP 07282851 A	HCAPLUS
Tonen Corp	1992	JP 04204522 A	HCAPLUS

L31 ANSWER 6 OF 28 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2000:553814 HCAPLUS

DN 133:137869

TI Dioxolane as a protector for lithium battery anodes  
 IN Nimon, Yevgeniy S.; Visco, Steven J.; Chu, May-Ying  
 PA Polyplus Battery Company, Inc., USA  
 SO PCT Int. Appl., 50 pp.

CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2000046870	A1	<u>20000810</u>	WO 2000-US2732	20000204 <--
	W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				

PRAI US 1999-245167 A 19990205 <--

OS MARPAT 133:137869

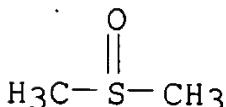
AB Disclosed are dioxolane-treated lithium electrodes, battery cells containing such dioxolane-treated lithium electrodes, battery cell electrolytes containing dioxolane, and methods of treating lithium electrodes with dioxolane. Treating lithium with dioxolane prevents the lithium from reacting with a wide range of substances which can contaminate battery cells, particularly moisture and other protic impurities, that might otherwise react with lithium to the detriment of its function as a neg. electrode in a battery. Battery cells containing dioxolane as an electrolyte co-solvent in accordance with the present invention exhibit improved cycling performance over cells not containing dioxolane. Moreover, the dioxolane treatment does not neg. impact sulfur utilization and improves the lithium's electrochem. function as the neg. electrode in a battery.

IT 67-68-5, DMSO, uses 68-12-2, uses 110-86-1,  
 Pyridine, uses 680-31-9 Hexamethylphosphoramide, uses  
 7439-93-2, Lithium, uses 7439-93-2D, Lithium,  
 intercalation compound, uses 7704-34-9, Sulfur, uses  
 7791-03-9, Lithium perchlorate 14283-07-9, Lithium  
 tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate  
 29935-35-1, Lithium hexafluoroarsenate 33454-82-9,  
 Lithium triflate 90076-65-6

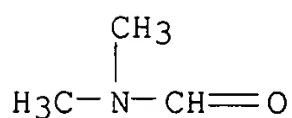
RL: DEV (Device component use); USES (Uses)  
 (dioxolane as a protector for lithium battery anodes)

RN 67-68-5 HCAPLUS

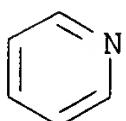
CN Methane, sulfinylbis- (9CI) (CA INDEX NAME)



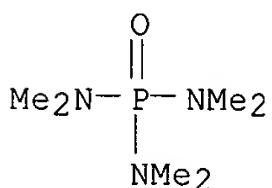
RN 68-12-2 HCPLUS  
 CN Formamide, N,N-dimethyl- (8CI, 9CI) (CA INDEX NAME)



RN 110-86-1 HCPLUS  
 CN Pyridine (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



RN 680-31-9 HCPLUS  
 CN Phosphoric triamide, hexamethyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 7439-93-2 HCPLUS  
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

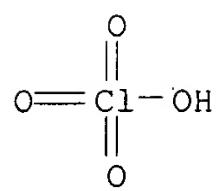
RN 7439-93-2 HCPLUS  
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

RN 7704-34-9 HCPLUS  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

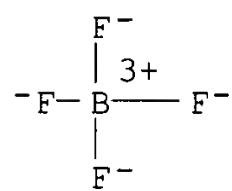
S

RN 7791-03-9 HCPLUS  
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)

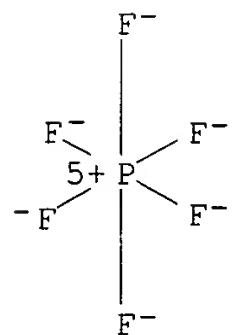


## ● Li

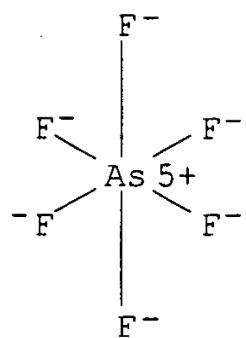
RN 14283-07-9 HCAPLUS  
 CN Borate(1-), tetrafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)

●  $\text{Li}^+$ 

RN 21324-40-3 HCAPLUS  
 CN Phosphate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)

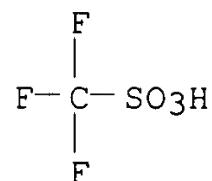
●  $\text{Li}^+$ 

RN 29935-35-1 HCAPLUS  
 CN Arsenate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)



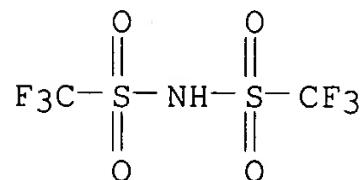
● Li<sup>+</sup>

RN 33454-82-9 HCAPLUS  
 CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 90076-65-6 HCAPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



● Li

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Bolster	1997			US 5691083 A	HCAPLUS
Chu	2000			US 6030720 A	HCAPLUS
Dan	1997			GB 2311410 A	
Dey	1976			US 3947289 A	HCAPLUS
Nimon	2000			US 6017651 A	HCAPLUS
Peled	1983			US 4410609 A	HCAPLUS
Peled, E	1989	136	1621	J Electrochem Soc	HCAPLUS

L31 ANSWER 7 OF 28 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 2000:421456 HCAPLUS

DN 133:32706

TI Nonaqueous electrolytes for batteries

IN Mikhaylik, Yuriy V.; Skotheim, Terje A.; Gorkovenko, Alexander A.

PA Moltech Corp., USA

SO PCT Int. Appl., 51 pp.

CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2000036683	A2	20000622	WO 1999-US30116	19991216 <--
	WO 2000036683	A3	20001109		
	W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	EP 1149428	A2	20011031	EP 1999-967390	19991216 <--
	EP 1149428	B1	20030319		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
PRAI	US 1998-215115	A2	19981217 <--		
	WO 1999-US30116	W	19991216 <--		
AB	The present invention relates generally to the field of nonaq. electrolytes for use in elec. current producing cells. More particularly, the present invention pertains to nonaq. electrolytes comprising a highly concentrated solution of one or more lithium salts in one or more nonaq. solvents.				
	More specifically, the present invention pertains to nonaq. electrolytes, suitable for use in an elec. current producing cell, comprising: (a) one or more lithium salts, dissolved in (b) one or more nonaq. oxygen-containing solvents; wherein the concentration of the one or more lithium salts is: (i) >110% of the molar concentration of the one or more lithium salts which would provide maximum ionic conductivity at 25° in the one or more solvents; and, (ii) >1.3M. The present invention also pertains to elec. current producing cells comprising such nonaq. electrolytes, and methods for increasing the safety and cycle life of an elec. current producing cell.				
IT	7439-93-2, Lithium, uses 7704-34-9, Sulfur, uses RL: DEV (Device component use); USES (Uses) (nonaq. electrolytes for batteries)				
RN	7439-93-2 HCAPLUS				
CN	Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)				

Li

RN 7704-34-9 HCAPLUS

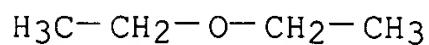
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

IT 60-29-7, Diethyl ether, uses 123-91-1, 1,4-Dioxane, uses  
 126-33-0 33454-82-9, Lithium triflate 90076-65-6 *2nd*  
 RL: DEV (Device component use); TEM (Technical or engineered material  
 use); USES (Uses)  
 (nonaq. electrolytes for batteries)

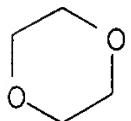
RN 60-29-7 HCPLUS

CN Ethane, 1,1'-oxybis- (9CI) (CA INDEX NAME)



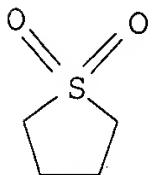
RN 123-91-1 HCPLUS

CN 1,4-Dioxane (9CI) (CA INDEX NAME)



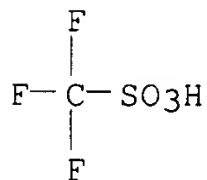
RN 126-33-0 HCPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (8CI, 9CI) (CA INDEX NAME)



RN 33454-82-9 HCPLUS

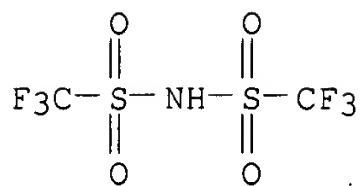
CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 90076-65-6 HCPLUS

CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



● Li

L31 ANSWER 8 OF 28 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2000:141485 HCAPLUS  
 DN 132:168757  
 TI Liquid electrolyte lithium-sulfur batteries  
 IN Chu, May-Ying; De Jonghe, Lutgard C.; Visco, Steven J.; Katz, Bruce D.  
 PA Polyplus Battery Co., Inc., USA  
 SO U.S., 28 pp., Cont.-in-part of U.S. 5,686,201  
 CODEN: USXXAM

DT Patent

LA English

FAN.CNT 15

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6030720	A	20000229	US 1997-948969	19971010 <--
	US 5523179	A	19960604	US 1994-344384	19941123 <--
	US 5582623	A	19961210	US 1995-479687	19950607 <--
	US 5686201	A	19971111	US 1996-686609	19960726 <--
	CA 2305454	AA	19990422	CA 1998-2305454	19981006 <--
	WO 9919931	A1	19990422	WO 1998-US21067	19981006 <--
	W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW				
	RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	AU 9896876	A1	19990503	AU 1998-96876	19981006 <--
	AU 741815	B2	20011213		
	EP 1021849	A1	20000726	EP 1998-950967	19981006 <--
	EP 1021849	B1	20030122		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	BR 9812749	A	20000829	BR 1998-12749	19981006 <--
	JP 2001520447	T2	20011030	JP 2000-516392	19981006 <--
	AT 231653	E	20030215	AT 1998-950967	19981006 <--
	US 6358643	B1	20020319	US 2000-495639	20000201 <--
PRAI	US 1994-344384	A2	19941123	<--	
	US 1995-479687	A2	19950607	<--	
	US 1996-686609	A2	19960726	<--	
	US 1997-948969	A	19971010	<--	
	WO 1998-US21067	W	19981006	<--	
OS	MARPAT 132:168757				
AB	Disclosed are electrolyte solvents for ambient-temperature lithium-sulfur batteries. The disclosed solvents include at least one ethoxy repeating unit compound of the general formula R1(CH <sub>2</sub> CH <sub>2</sub> O) <sub>n</sub> R2, where n ranges between 2 and 10 and R1 and R2 are different or identical alkyl or alkoxy groups				

(including substituted alkyl or alkoxy groups). Alternatively, R1 and R2 may together with  $(CH_2CH_2O)_n$  form a closed ring. Examples of linear solvents include the glymes  $(CH_3O(CH_2CH_2)_nCH_3)$ . Some electrolyte solvents include a donor or acceptor solvent in addition to an ethoxy compound as described. Examples of donor solvents include hexamethylphosphoramide, pyridine, N,N-diethylacetamide, N,N-diethylformamide, dimethylsulfoxide, tetramethylurea, N,N-dimethylacetamide, N,N-dimethylformamide, tributylphosphate, trimethylphosphate, N,N,N',N'-tetraethylsulfamide, tetramethylenediamine, tetramethylpropylenediamine, and pentamethyldiethylenetriamine. These assist in solvation of lithium ions. Examples of acceptor solvents include alcs., glycols, and polyglycols. These assist in solvation of the sulfide and polysulfide anions.

IT 7439-93-2, Lithium, uses 7439-93-2D, Lithium, intercalation compound, uses 7704-34-9, Sulfur, uses 90076-65-6

RL: DEV (Device component use); USES (Uses)  
(liquid electrolyte lithium-sulfur batteries)

RN 7439-93-2 HCPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

## Li

RN 7439-93-2 HCPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

## Li

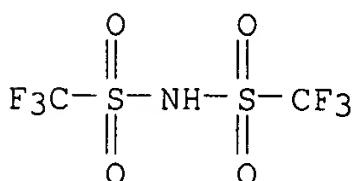
RN 7704-34-9 HCPLUS

CN Sulfur (8CI, 9CI) (CA INDEX NAME)

## S

RN 90076-65-6 HCPLUS

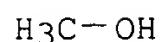
CN Methanesulfonamide, 1,1,1-trifluoro-N-[ (trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



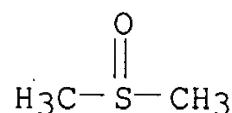
## ● Li

IT 67-56-1, Methanol, uses 67-68-5, Dimethylsulfoxide, uses 68-12-2, N,N-Dimethylformamide, uses 110-86-1, Pyridine, uses 680-31-9, Hexamethylphosphoramide, uses RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
(liquid electrolyte lithium-sulfur batteries)

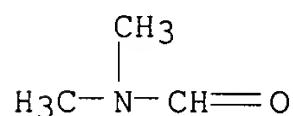
RN 67-56-1 HCAPLUS  
 CN Methanol (8CI, 9CI) (CA INDEX NAME)



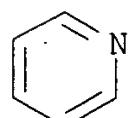
RN 67-68-5 HCAPLUS  
 CN Methane, sulfinylbis- (9CI) (CA INDEX NAME)



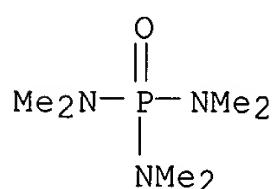
RN 68-12-2 HCAPLUS  
 CN Formamide, N,N-dimethyl- (8CI, 9CI) (CA INDEX NAME)



RN 110-86-1 HCAPLUS  
 CN Pyridine (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



RN 680-31-9 HCAPLUS  
 CN Phosphoric triamide, hexamethyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



## RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	1972			FR 2124388	HCAPLUS
Anon	1982			GB 2084391	HCAPLUS
Anon	1984			GB 2273603 A	HCAPLUS
Anon	1994			EP 0602984 A2	HCAPLUS
Anon	1994			JP 06275313	HCAPLUS
Anon	1994			GB 2137406 A	HCAPLUS
Bennett	1984			US 4469761	HCAPLUS
Chang	1979			US 4143214	HCAPLUS
de Jonghe	1990			US 4917974	HCAPLUS
Dejonghe	1989			US 4833048	HCAPLUS

Dey	1974		US 3806369	
Farrington	1976		US 3953231	HCAPLUS
Farrington	1981		US 4268587	HCAPLUS
Kummer	1968		US 3404035	HCAPLUS
Kummer	1968		US 3413150	HCAPLUS
Lauck	1975		US 3907591	HCAPLUS
Lauck	1975		US 3915743	HCAPLUS
Nishimura	1977		US 4008357	HCAPLUS
Nole	1970		US 3532543	HCAPLUS
Peled	1983		US 4410609	HCAPLUS
Perichaud	1987		US 4644911	
Soffer	1979		US 4132837	HCAPLUS
Toshiba, S	1997	42	1019   Electrochimica Acta	
Wilkinson	1992		US 5130211	HCAPLUS

L31 ANSWER 9 OF 28 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1999:566293 HCAPLUS

DN 131:172706

TI Method for producing membrane of gel composite electrolyte for batteries  
IN Yamamoto, Tetsu; Murata, Makoto  
PA Aventis Research and Technologies GmbH and Co. KG, Germany  
SO PCT Int. Appl., 22 pp.

CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9944247	A1	19990902	WO 1999-JP834	19990224 <--
	W: CA, JP, KR, US				
	RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, NL, PT				
	CA 2318835	AA	19990902	CA 1999-2318835	19990224 <--
	EP 1058951	A1	20001213	EP 1999-906463	19990224 <--
	EP 1058951	B1	20030604		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, PT, IE, FI				
	JP 2002510120	T2	20020402	JP 2000-533912	19990224 <--
	AT 242549	E	20030615	AT 1999-906463	19990224 <--
PRAI	JP 1998-43059	A	19980225	<--	
	WO 1999-JP834	W	19990224	<--	

AB A method is provided for the production of a membrane of gel composite electrolyte having a uniform membrane thickness. The method has the steps of: mixing a lithium salt, an electrolyte solvent having a b.p. at one atmospheric pressure of not less than 240° and a diluting solvent having a b.p. at one atmospheric pressure of from 40° to 210° to obtain an electrolyte solution; mixing the electrolyte solution with a gelling agent to obtain a gel composite electrolyte; shaping the gel composite electrolyte into a membrane configuration; and removing the diluting solvent from the gel composite electrolyte. The method is characterized by the use of a diluting solvent. The diluting solvent facilitates the shaping step, thereby producing an electrolyte membrane having a uniform thickness. The gelling agent may be fumed silica.

IT 7439-93-2D, Lithium, salt, uses 33454-82-9, Lithium trifluoromethanesulfonate

RL: DEV (Device component use); USES (Uses)

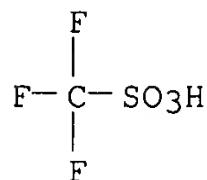
(method for producing membrane of gel composite electrolyte for batteries)

RN 7439-93-2 HCAPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

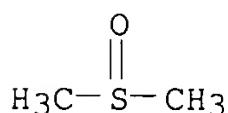
Li

RN 33454-82-9 HCAPLUS  
CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)

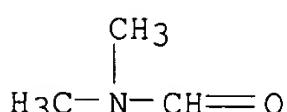


Li

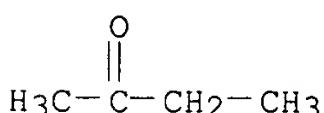
IT 67-68-5, Dmso, uses 68-12-2, uses 78-93-3,  
2-Butanone, uses 96-48-0 108-32-7, Propylene carbonate  
7704-34-9D, Sulfur, compound, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(method for producing membrane of gel composite electrolyte for  
batteries)  
RN 67-68-5 HCAPLUS  
CN Methane, sulfinylbis- (9CI) (CA INDEX NAME)



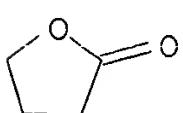
RN 68-12-2 HCAPLUS  
CN Formamide, N,N-dimethyl- (8CI, 9CI) (CA INDEX NAME)



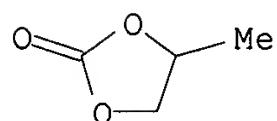
RN 78-93-3 HCAPLUS  
CN 2-Butanone (8CI, 9CI) (CA INDEX NAME)



RN 96-48-0 HCAPLUS  
CN 2 (3H)-Furanone, dihydro- (8CI, 9CI) (CA INDEX NAME)



RN 108-32-7 HCAPLUS  
 CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



RN 7704-34-9 HCAPLUS  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	1997	144	399	Journal of the Elect	
Arnold, C	1997			US 5691080 A	HCAPLUS
Bell Communications Res	1995			WO 9531835 A	HCAPLUS
Fan, J	1998			WO 9859388 A	HCAPLUS
Gozdz, A	1994			US 5296318 A	HCAPLUS
Matsuo, Y	1995	79	295	Solid State Ionics	HCAPLUS
Polyplus Battery Co Inc	1996			WO 9616450 A	HCAPLUS
Varta Batterie	1991			EP 0416243 A	HCAPLUS

L31 ANSWER 10 OF 28 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1999:271600 HCAPLUS

DN 130:284490

TI Liquid electrolyte lithium-sulfur batteries

IN Chu, May-Ying; De Jonghe, Lutgard C.; Visco, Steven J.; Katz, Bruce D.

PA Polyplus Battery Company, Inc., USA

SO PCT Int. Appl., 57 pp.

CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 15

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9919931	A1	19990422	WO 1998-US21067	19981006 <--
	W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW				
	RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	US 6030720	A	20000229	US 1997-948969	19971010 <--
	CA 2305454	AA	19990422	CA 1998-2305454	19981006 <--
	AU 9896876	A1	19990503	AU 1998-96876	19981006 <--
	AU 741815	B2	20011213		
	EP 1021849	A1	20000726	EP 1998-950967	19981006 <--
	EP 1021849	B1	20030122		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	BR 9812749	A	20000829	BR 1998-12749	19981006 <--

JP 2001520447	T2	20011030	JP 2000-516392	19981006 <--
AT 231653	E	20030215	AT 1998-950967	19981006 <--
PRAI US 1997-948969	A	19971010	<--	
US 1994-344384	A2	19941123	<--	
US 1995-479687	A2	19950607	<--	
US 1996-686609	A2	19960726	<--	
WO 1998-US21067	W	19981006	<--	

OS MARPAT 130:284490

AB Disclosed are electrolyte solvents for ambient-temperature lithium-sulfur batteries. The disclosed solvents include at least one ethoxy repeating unit compound of the general formula R1(CH<sub>2</sub>CH<sub>2</sub>O)<sub>n</sub>R2, where n ranges between 2 and 10 and R1 and R2 are different or identical alkyl or alkoxy groups (including substituted alkyl or alkoxy groups). Alternatively, R1 and R2 may together with (CH<sub>2</sub>CH<sub>2</sub>O)<sub>n</sub> form a closed ring. Examples of linear solvents include the glymes (CH<sub>3</sub>O(CH<sub>2</sub>CH<sub>2</sub>)<sub>n</sub>CH<sub>3</sub>). Some electrolyte solvents include a donor or acceptor solvent in addition to an ethoxy compound as described. Examples of donor solvents include hexamethylphosphoramide, pyridine, N,N-diethylacetamide, N,N-diethylformamide, dimethylsulfoxide, tetramethylurea, N,N-dimethylacetamide, N,N-dimethylformamide, tributylphosphate, trimethylphosphate, N,N,N',N'-tetraethylsulfamide, tetramethylenediamine, tetramethylpropylenediamine, and pentamethyldiethylenetriamine. These assist in solvation of lithium ions. Examples of acceptor solvents include alcs., glycols, and polyglycols. These assist in solvation of the sulfide and polysulfide anions.

IT 7439-93-2, Lithium, uses 7439-93-2D, Lithium, intercalation compound, uses 7704-34-9, Sulfur, uses 7791-03-9, Lithium perchlorate 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate

29935-35-1, Lithium hexafluoroarsenate 33454-82-9,

Lithium triflate 90076-65-6

RL: DEV (Device component use); USES (Uses)  
(liquid electrolyte lithium-sulfur batteries)

RN 7439-93-2 HCPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

## Li

RN 7439-93-2 HCPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

## Li

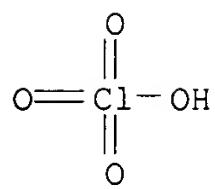
RN 7704-34-9 HCPLUS

CN Sulfur (8CI, 9CI) (CA INDEX NAME)

## S

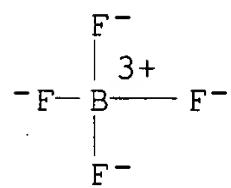
RN 7791-03-9 HCPLUS

CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)

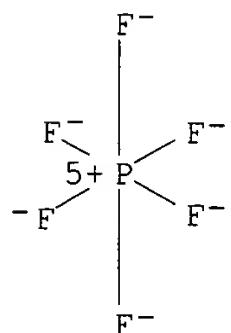


## ● Li

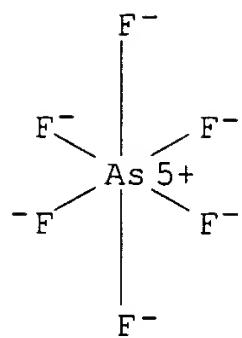
RN 14283-07-9 HCPLUS  
 CN Borate(1-), tetrafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)

● Li<sup>+</sup>

RN 21324-40-3 HCPLUS  
 CN Phosphate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)

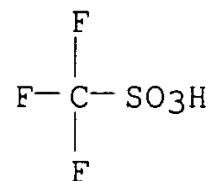
● Li<sup>+</sup>

RN 29935-35-1 HCPLUS  
 CN Arsenate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)



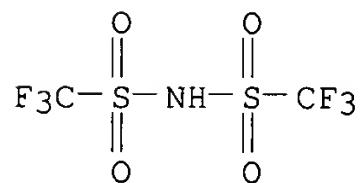
● Li<sup>+</sup>

RN 33454-82-9 HCPLUS  
 CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 90076-65-6 HCPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME.)

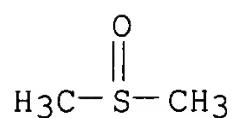


● Li

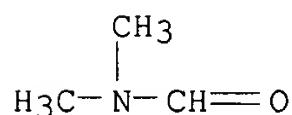
IT 67-56-1, Methanol, uses 67-68-5, Dimethylsulfoxide, uses 68-12-2, N,N-Dimethylformamide, uses 110-86-1, Pyridine, uses 680-31-9, Hexamethylphosphoramide, uses  
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
 (liquid electrolyte lithium-sulfur batteries)  
 RN 67-56-1 HCPLUS  
 CN Methanol (8CI, 9CI) (CA INDEX NAME)

H<sub>3</sub>C-OH

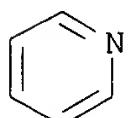
RN 67-68-5 HCAPLUS  
 CN Methane, sulfinylbis- (9CI) (CA INDEX NAME)



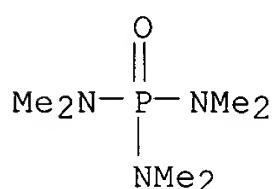
RN 68-12-2 HCAPLUS  
 CN Formamide, N,N-dimethyl- (8CI, 9CI) (CA INDEX NAME)



RN 110-86-1 HCAPLUS  
 CN Pyridine (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



RN 680-31-9 HCAPLUS  
 CN Phosphoric triamide, hexamethyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



## RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Chu, M	1996			US 5523179 A	HCAPLUS
Du Pont	1970			FR 2014610 A	HCAPLUS
Du Pont	1972			FR 2124388 A	HCAPLUS
Lauck, H	1975			US 3907591 A	HCAPLUS
Peled, E	1989	26	269	Journal of Power Sou	
Tobishima, S	1997	42	1019	Electrochimica Acta	HCAPLUS
Univ Ramot	1982			GB 2084391 A	HCAPLUS

L31 ANSWER 11 OF 28 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1997:203971 HCAPLUS

DN 126:201656

TI Secondary nonaqueous electrolyte batteries and manufacture of anodes for the batteries

IN Ito, Shuji; Murata, Toshihide; Hasegawa, Masaki; Mifudi, Yasuhiko; Toyoguchi, Yoshinori

PA Matsushita Electric Ind Co Ltd, Japan

SO Jpn. Kokai Tokkyo Koho, 27 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 09027317	A2	19970128	JP 1995-158232	19950623 <--
	US 5629109	A	19970513	US 1995-492681	19950620 <--
PRAI	JP 1994-142936	A	19940624 <--		
	JP 1995-112164	A	19950510 <--		

AB The batteries use anodes composed of a carbonaceous material containing S 7-35, O 6.5-25, and/or N 10.5-18.3%. The anodes are prepared by using the above carbonaceous material obtained by heat treating a mixture of an org compound containing S, O, and/or N and a metal halide or a halogen at 500-1400° in an inert atmospheric

IT 75-05-8, Acetonitrile, processes 110-86-1, Pyridine, *2nd*  
processes  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(in manufacture of nitrogen containing carbonaceous materials for secondary nonaq. battery anodes)

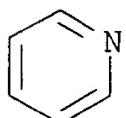
RN 75-05-8 HCPLUS

CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

~~H<sub>3</sub>C-C≡N~~

RN 110-86-1 HCPLUS

CN Pyridine (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

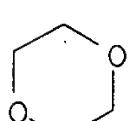


IT 123-91-1, 1,4-Dioxane, processes

RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(in manufacture of oxygen containing carbonaceous materials for secondary nonaq.  
battery anodes)

RN 123-91-1 HCPLUS

CN 1,4-Dioxane (9CI) (CA INDEX NAME)



IT 7439-93-2, Lithium, uses

RL: DEV (Device component use); USES (Uses)  
(manufacture of sulfur and oxygen and nitrogen containing carbonaceous materials  
for lithium intercalating anodes for batteries)

RN 7439-93-2 HCPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 7704-34-9, Sulfur, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (manufacture of sulfur and oxygen and nitrogen containing carbonaceous materials  
 for secondary nonaq. battery anodes)  
 RN 7704-34-9 HCPLUS  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

L31 ANSWER 24 OF 28 HCPLUS COPYRIGHT 2006 ACS on STN  
 AN 1982:500657 HCPLUS  
 DN 97:100657  
 TI Primary battery  
 IN Peled, Emanuel; Yamin, Hertzel  
 PA Ramot University Authority for Applied Research and Industrial Development Ltd., Israel  
 SO Fr. Demande, 19 pp.  
 CODEN: FRXXBL  
 DT Patent  
 LA French  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	FR 2490881	A1	19820326	FR 1981-17647	19810918 <--
	FR 2490881	B1	19850802		
	IL 61085	A1	19830731	IL 1980-61085	19800919 <--
	DE 3136820	A1	19820616	DE 1981-3136820	19810916 <--
	DE 3136820	C2	19910221		
	GB 2084391	A	19820407	GB 1981-28173	19810917 <--
	GB 2084391	B2	19840516		
	US 4410609	A	19831018	US 1981-303020	19810917 <--
	JP 57145272	A2	19820908	JP 1981-147687	19810918 <--
PRAI	IL 1980-61085	A	19800919 <--		

AB This high-energy-d. primary battery is based on a Li, Na or alloy dischargeable anode, a porous inert current collector, and a solvent in which polysulfide and an electrolyte are dissolved. Preferably, the solvent produces a limited dissoln. of the polysulfide. For example, a button cell is described with a volume of 6 cm<sup>3</sup> (5.2 + 2.3 + 0.5 cm). The polysulfide solution is prepared by mixing a predetd. quantity of Li with S dissolved in THF, for 50 h. The composition of the solution is 1.2M Li<sub>2</sub>S<sub>7.5</sub>. LiBr, dried under vacuum, is added to this solution to obtain a 1M solution. The cathodic current collector is made of C bonded to Teflon, supported on Ni. It is charged with 1.6 g of S. A porous polypropylene separator is inserted between the electrodes. The total capacity of the battery is 4A-h. The initial open-circuit potential is .apprx.2.35 V. The battery was maintained in service for >2 mo and furnished >3A-h up to a cutoff potential of 1.5 V, i.e. the consumption of S was >75%. The bulk energy d. of this battery, based on its inner volume, is 1.05 W-h/cm<sup>3</sup>.

IT 7704-34-9, uses and miscellaneous

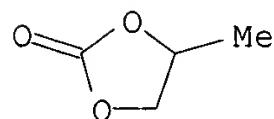
RL: USES (Uses)  
 (battery, primary with lithium)  
 RN 7704-34-9 HCPLUS  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

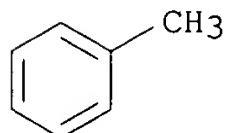
IT 7439-93-2, uses and miscellaneous  
 RL: USES (Uses)  
 (battery, primary, with sulfur)  
 RN 7439-93-2 HCPLUS  
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

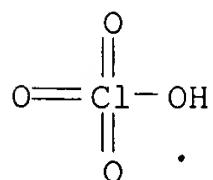
IT 108-32-7 108-88-3, uses and miscellaneous  
 RL: PRP (Properties)  
 (in primary lithium-sulfur battery)  
 RN 108-32-7 HCPLUS  
 CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



RN 108-88-3 HCPLUS  
 CN Benzene, methyl- (9CI) (CA INDEX NAME)



IT 7791-03-9  
 RL: PRP (Properties)  
 (primary battery electrolyte containing lithium polysulfide and)  
 RN 7791-03-9 HCPLUS  
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

=> d his

(FILE 'HOME' ENTERED AT 14:29:29 ON 06 DEC 2006)  
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SEL RN

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L3 6 S L2 AND LI/ELS  
L4 1 S LITHIUM/CN  
L5 6 S LI/MF NOT MASS  
L6 12 S L3-L5  
L7 1 S SULFUR/CN  
L8 26 S S/MF NOT MASS  
L9 21 S L8 NOT (34S2 OR E35S2 OR 37S2 OR 33S2 OR MNS/CI)  
L10 21 S L7,L9  
L11 11 S 680-31-9 OR 96-48-0 OR 67-63-0 OR 67-56-1 OR 64-17-5 OR 96-49  
L12 12 S 623-53-0 OR 462-06-6 OR 25496-08-6 OR 78-93-3 OR 110-86-1 OR  
L13 48 S C7H7F/MF AND 46.150.18/RID  
L14 5 S L13 NOT (11C# OR 13C# OR 14C# OR C11# OR C13# OR C14# OR (D O  
L15 16 S L12,L14

FILE 'HCAPLUS' ENTERED AT 14:54:43 ON 06 DEC 2006  
L16 104669 S L6  
L17 3423 S L10 AND L16  
L18 164 S L17 AND L11  
L19 58 S L18 AND L15  
L20 36 S L19 AND (PY<=2001 OR PRY<=2001 OR AY<=2001)  
L21 31 S L19 AND (PY<=2000 OR PRY<=2000 OR AY<=2000)  
L22 5 S L20 NOT L21  
SEL AN DN 1 2 5  
L23 2 S L22 NOT E48-E56  
L24 28 S L21 AND (PD<=20000725 OR PRD<=20000725 OR AD<=20000725)  
L25 3 S L21 NOT L24  
L26 33 S L23-L25  
L27 33 S L1,L26  
L28 5 S L27 AND (HWANG? OR CHOI? OR LEE? OR JUNG? OR KIM?) /AU  
L29 5 S L27 AND SAMSUN?/PA,CS  
L30 5 S L28,L29  
L31 28 S L27 NOT L30

FILE 'HCAPLUS' ENTERED AT 15:27:55 ON 06 DEC 2006

=>

=> d his

(FILE 'HOME' ENTERED AT 14:29:29 ON 06 DEC 2006)  
SET COST OFF

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SEL RN

FILE 'REGISTRY' ENTERED AT 14:45:18 ON 06 DEC 2006  
L2 47 S E1-E47  
L3 6 S L2 AND LI/ELS  
L4 1 S LITHIUM/CN  
L5 6 S LI/MF NOT MASS  
L6 12 S L3-L5  
L7 1 S SULFUR/CN  
L8 26 S S/MF NOT MASS  
L9 21 S L8 NOT (34S2 OR E35S2 OR 37S2 OR 33S2 OR MNS/CI)  
L10 21 S L7,L9  
L11 11 S 680-31-9 OR 96-48-0 OR 67-63-0 OR 67-56-1 OR 64-17-5 OR 96-49  
L12 12 S 623-53-0 OR 462-06-6 OR 25496-08-6 OR 78-93-3 OR 110-86-1 OR  
L13 48 S C7H7F/MF AND 46.150.18/RID  
L14 5 S L13 NOT (11C# OR 13C# OR 14C# OR C11# OR C13# OR C14# OR (D O  
L15 16 S L12,L14

FILE 'HCAPLUS' ENTERED AT 14:54:43 ON 06 DEC 2006  
L16 104669 S L6  
L17 3423 S L10 AND L16  
L18 164 S L17 AND L11  
L19 58 S L18 AND L15  
L20 36 S L19 AND (PY<=2001 OR PRY<=2001 OR AY<=2001)  
L21 31 S L19 AND (PY<=2000 OR PRY<=2000 OR AY<=2000)  
L22 5 S L20 NOT L21  
SEL AN DN 1 2 5  
L23 2 S L22 NOT E48-E56  
L24 28 S L21 AND (PD<=20000725 OR PRD<=20000725 OR AD<=20000725)  
L25 3 S L21 NOT L24  
L26 33 S L23-L25  
L27 33 S L1,L26  
L28 5 S L27 AND (HWANG? OR CHOI? OR LEE? OR JUNG? OR KIM?) /AU  
L29 5 S L27 AND SAMSUN?/PA,CS  
L30 5 S L28,L29  
L31 28 S L27 NOT L30

=> fil hcaplus

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FILE COVERS 1907 - 6 Dec 2006 VOL 145 ISS 24  
 FILE LAST UPDATED: 5 Dec 2006 (20061205/ED)

New CAS Information Use Policies, enter HELP USAGETERMS for details.

This file contains CAS Registry Numbers for easy and accurate substance identification.

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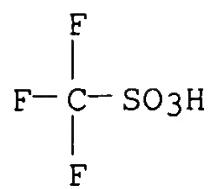
L30	ANSWER 1 OF 5 HCAPLUS COPYRIGHT 2006 ACS on STN				
AN	2002:964986 HCAPLUS				
DN	138:15307				
TI	Lithium-sulfur batteries with good cycle life characteristics				
IN	Choi, Soo Seok; Choi, Yunsuk; Jung, Yongju; Lee, Jaewoan; Hwang, Duck Chul; Kim, Joo Soak; Park, Zin; Kim, Seok; Han, Ji Sung				
PA	Samsung SDI Co., Ltd., S. Korea				
SO	U.S. Pat. Appl. Publ., 16 pp.				
	CODEN: USXXCO				
DT	Patent				
LA	English				
FAN.CNT 1					
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002192557 KR 2002092029 JP 2002367678 CN 1389948	A1 A A2 A	20021219 20021211 20021220 20030108	US 2002-72907 KR 2001-30878 JP 2002-61349 CN 2002-116133	20020212 <-- 20010601 <-- 20020307 <-- 20020419 <--
PRAI	KR 2001-30878	A	20010601 <--		
AB	A lithium-sulfur battery having a pos. electrode including a pos. active material including an active sulfur, where the pos. electrode comprises an electron-conductive path and an ion-conductive path, and includes active pores of the average size of up to 20 $\mu\text{m}$ having both electron-conductive and ion-conductive properties, and are filled with the active sulfur during an electrochem. reaction of the battery.				
IT	7439-93-2, Lithium, uses 7704-34-9, Sulfur, uses 33454-82-9, Lithium triflate RL: DEV (Device component use); USES (Uses) (lithium-sulfur batteries with good cycle life characteristics)				
RN	7439-93-2 HCAPLUS				
CN	Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)				

Li

RN 7704-34-9 HCAPLUS  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

RN 33454-82-9 HCAPLUS  
 CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)

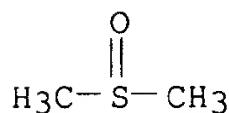


● Li

IT 67-68-5, Dmso, uses 96-48-0, Butyrolactone  
 110-86-1, Pyridine, uses 126-33-0, Sulfolane  
 680-31-9, Hexamethylphosphoramide, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (lithium-sulfur batteries with good cycle life characteristics)

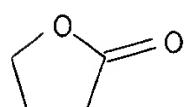
RN 67-68-5 HCPLUS

CN Methane, sulfinylbis- (9CI) (CA INDEX NAME)



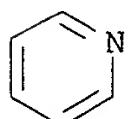
RN 96-48-0 HCPLUS

CN 2(3H)-Furanone, dihydro- (8CI, 9CI) (CA INDEX NAME)



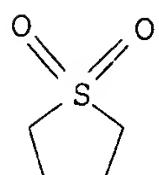
RN 110-86-1 HCPLUS

CN Pyridine (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



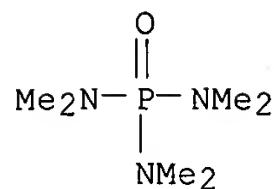
RN 126-33-0 HCPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (8CI, 9CI) (CA INDEX NAME)



RN 680-31-9 HCPLUS

CN Phosphoric triamide, hexamethyl- (6CI, 8CI, 9CI) (CA INDEX NAME)

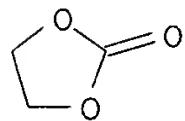


IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate

RL: MOA (Modifier or additive use); USES (Uses)  
(plasticizer; lithium-sulfur batteries with good cycle life characteristics)

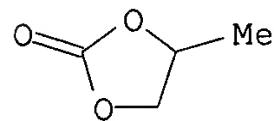
RN 96-49-1 HCPLUS

CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



RN 108-32-7 HCPLUS

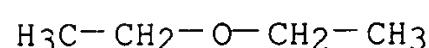
CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



IT 60-29-7, Ether, uses 64-17-5, Ethanol, uses  
67-56-1, Methanol, uses 110-82-7, Cyclohexane, uses  
RL: DEV (Device component use); USES (Uses)  
(solvent; lithium-sulfur batteries with good cycle life characteristics)

RN 60-29-7 HCPLUS

CN Ethane, 1,1'-oxybis- (9CI) (CA INDEX NAME)



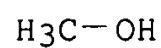
RN 64-17-5 HCPLUS

CN Ethanol (9CI) (CA INDEX NAME)



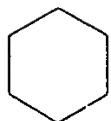
RN 67-56-1 HCPLUS

CN Methanol (8CI, 9CI) (CA INDEX NAME)



RN 110-82-7 HCPLUS

CN Cyclohexane (8CI, 9CI) (CA INDEX NAME)

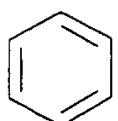


L30 ANSWER 2 OF 5 HCPLUS COPYRIGHT 2006 ACS on STN  
 AN 2002:256755 HCPLUS  
 DN 136:282001  
 TI Cathode active material composition for lithium-sulfur battery with good cycle life characteristics  
 IN Hwang, Duck Chul; Choi, Yun Suk; Choi, Soo  
     Seok; Lee, Jea Woan; Jung, Yong Ju; Kim, Joo  
     Soak; Park, Zin  
 PA Samsung Sdi Co., Ltd., S. Korea  
 SO U.S. Pat. Appl. Publ., 9 pp.  
 CODEN: USXXCO  
 DT Patent  
 LA English  
 FAN.CNT 1

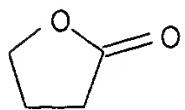
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002039680 US 6919143 KR 2002014195 KR 2002048447 JP 2002110237 CN 1339837	A1 B2 A A A2 A	20020404 20050719 20020225 20020624 20020412 20020313	US 2001-931079 KR 2000-47347 KR 2000-76694 JP 2001-247174 CN 2001-135732	20010817 <-- 20000817 <-- 20001214 <-- 20010816 <-- 20010817 <--
PRAI	KR 2000-47347 KR 2000-76694	A A	20000817 20001214	<-- <--	
AB	A pos. active material composition for a lithium-sulfur battery includes a pos. active material, a conductive agent, an organic mixing solvent to which solubility of sulfur is equal to or less than 50 mM, and a binder capable of dissolving in the organic mixing solvent.				
IT	64-17-5, Ethanol, uses 71-43-2, Benzene, uses 96-48-0, $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 108-88-3, Toluene, uses 109-60-4, Propyl acetate 110-82-7, Cyclohexane, uses 126-33-0, Sulfolane 462-06-6, Fluorobenzene 623-53-0, Ethylmethyl carbonate 7704-34-9D, Sulfur, organic compound 7791-03-9, Lithium perchlorate 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 33454-82-9, Lithium triflate 90076-65-6				
RL	DEV (Device component use); USES (Uses) (cathode active material composition for lithium-sulfur battery with good cycle life characteristics)				
RN	64-17-5 HCPLUS				
CN	Ethanol (9CI) (CA INDEX NAME)				



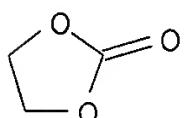
RN 71-43-2 HCPLUS  
 CN Benzene (8CI, 9CI) (CA INDEX NAME)



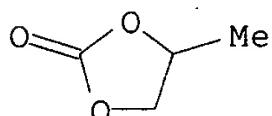
RN 96-48-0 HCPLUS  
 CN 2(3H)-Furanone, dihydro- (8CI, 9CI) (CA INDEX NAME)



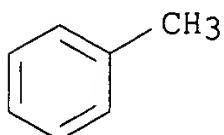
RN 96-49-1 HCPLUS  
 CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



RN 108-32-7 HCPLUS  
 CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



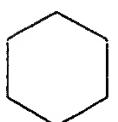
RN 108-88-3 HCPLUS  
 CN Benzene, methyl- (9CI) (CA INDEX NAME)



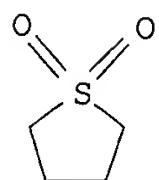
RN 109-60-4 HCPLUS  
 CN Acetic acid, propyl ester (6CI, 8CI, 9CI) (CA INDEX NAME)

n-Pr—O—Ac

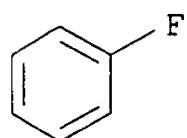
RN 110-82-7 HCPLUS  
 CN Cyclohexane (8CI, 9CI) (CA INDEX NAME)



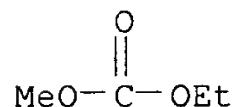
RN 126-33-0 HCPLUS  
 CN Thiophene, tetrahydro-, 1,1-dioxide (8CI, 9CI) (CA INDEX NAME)



RN 462-06-6 HCPLUS  
 CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



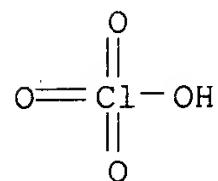
RN 623-53-0 HCPLUS  
 CN Carbonic acid, ethyl methyl ester (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 7704-34-9 HCPLUS  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

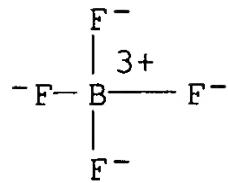
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RN 7791-03-9 HCPLUS  
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



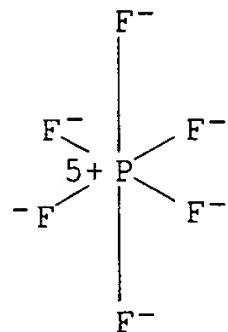
● Li

RN 14283-07-9 HCPLUS  
 CN Borate(1-), tetrafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)



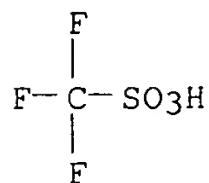
●  $\text{Li}^+$

RN 21324-40-3 HCPLUS  
 CN Phosphate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)



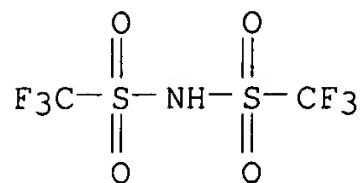
●  $\text{Li}^+$

RN 33454-82-9 HCPLUS  
 CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

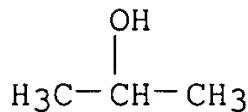
RN 90076-65-6 HCPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



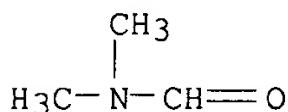
● Li

IT 67-63-0, Isopropyl alcohol, uses 68-12-2, Dmf, uses  
 75-05-8, Acetonitrile, uses  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (cathode active material composition for lithium-sulfur battery with good  
 cycle life characteristics)

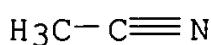
RN 67-63-0 HCAPLUS  
 CN 2-Propanol (9CI) (CA INDEX NAME)



RN 68-12-2 HCAPLUS  
 CN Formamide, N,N-dimethyl- (8CI, 9CI) (CA INDEX NAME)



RN 75-05-8 HCAPLUS  
 CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



#### RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	2000			CN 1271968 A	HCAPLUS
Carlson	2002			US 6488721 B1	HCAPLUS
Chu	1998			US 5814420 A	HCAPLUS
Chu	2000			US 6030720 A	HCAPLUS
Geronov	2002			US 6344293 B1	HCAPLUS
Igarashi	2003			US 6573004 B1	HCAPLUS
Nakagiri	2003			US 6576370 B1	HCAPLUS
Semel	1994			US 5298055 A	HCAPLUS
Takezawa	2004			US 6733927 B1	HCAPLUS

L30 ANSWER 3 OF 5 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2002:103441 HCAPLUS  
 DN 136:153869  
 TI Lithium-sulfur batteries with high capacity and good rate capability

IN Jung, Yongju; Kim, Seok; Choi, Yunsuk;  
 Choi, Soo Seok; Lee, Jeawoan; Hwang, Duck Chul  
 ; Kim, Joo Soak

PA Samsung SDI Co., Ltd., S. Korea  
 SO Eur. Pat. Appl., 10 pp.  
 CODEN: EPXXDW

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1178555	A2	20020206	EP 2001-117788	20010802 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	KR 2002011562	A	20020209	KR 2000-44900	20000802 <--
	KR 2002011563	A	20020209	KR 2000-44901	20000802 <--
	JP 2002075446	A2	20020315	JP 2001-213286	20010713 <--
	US 2002045102	A1	20020418	US 2001-918463	20010801 <--
	CN 1336696	A	20020220	CN 2001-132527	20010802 <--
PRAI	KR 2000-44900	A	20000802	<--	
	KR 2000-44901	A	20000802	<--	

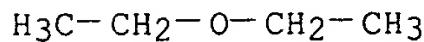
AB A lithium-sulfur battery includes a neg. electrode, a pos. electrode, and an electrolyte. The neg. electrode includes a neg. active material selected from materials in which lithium intercalation reversibly occur, lithium alloy or lithium metal. The pos. electrode includes at least one of elemental sulfur and organosulfur compds. for a pos. active material, and an elec. conductive material. The electrolyte includes at least two groups selected from a weak polar solvent group, a strong polar solvent group and a lithium protection solvent group, where the electrolyte includes at least one or more solvents selected from the same group. The electrolyte may optionally include one or more electrolyte salts.

IT 60-29-7, Diethyl ether, uses 67-68-5, Dmso, uses  
 68-12-2, Dmf, uses 75-05-8, Acetonitrile, uses  
 96-48-0,  $\gamma$ -Butyrolactone 108-88-3, Toluene, uses  
 123-91-1, 1,4-Dioxan, uses 126-33-0, Sulfolane  
 680-31-9, Hexamethyl phosphoric triamide, uses 7439-93-2  
 , Lithium, uses 7704-34-9, Sulfur, uses 7704-34-9D,  
 Sulfur, organic compound 7791-03-9, Lithium perchlorate  
 14283-07-9, Lithium tetrafluoroborate 21324-40-3,  
 Lithium hexafluorophosphate 33454-82-9, Lithium triflate  
 90076-65-6

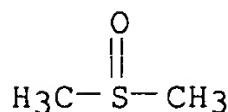
RL: DEV (Device component use); USES (Uses)  
 (lithium-sulfur batteries with high capacity and good rate capability)

RN 60-29-7 HCPLUS

CN Ethane, 1,1'-oxybis- (9CI) (CA INDEX NAME)

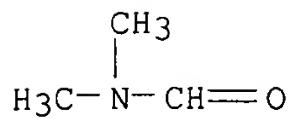


RN 67-68-5 HCPLUS  
 CN Methane, sulfinylbis- (9CI) (CA INDEX NAME)

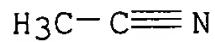


RN 68-12-2 HCPLUS

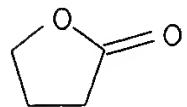
CN Formamide, N,N-dimethyl- (8CI, 9CI) (CA INDEX NAME)



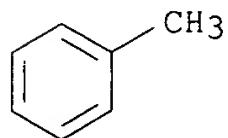
RN 75-05-8 HCPLUS  
 CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



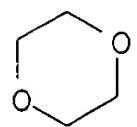
RN 96-48-0 HCPLUS  
 CN 2(3H)-Furanone, dihydro- (8CI, 9CI) (CA INDEX NAME)



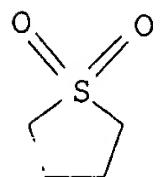
RN 108-88-3 HCPLUS  
 CN Benzene, methyl- (9CI) (CA INDEX NAME)



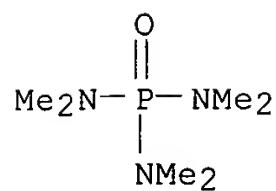
RN 123-91-1 HCPLUS  
 CN 1,4-Dioxane (9CI) (CA INDEX NAME)



RN 126-33-0 HCPLUS  
 CN Thiophene, tetrahydro-, 1,1-dioxide (8CI, 9CI) (CA INDEX NAME)



RN 680-31-9 HCPLUS  
 CN Phosphoric triamide, hexamethyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 7439-93-2 HCPLUS  
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

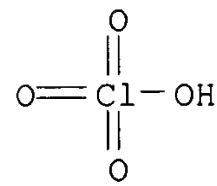
RN 7704-34-9 HCPLUS  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

RN 7704-34-9 HCPLUS  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

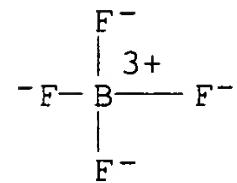
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RN 7791-03-9 HCPLUS  
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



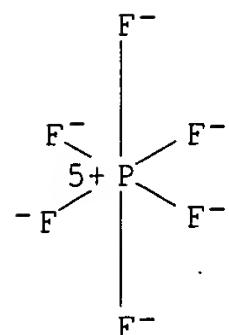
● Li

RN 14283-07-9 HCPLUS  
 CN Borate(1-), tetrafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)



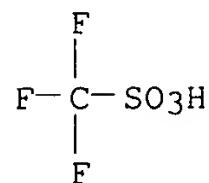
● Li<sup>+</sup>

RN 21324-40-3 HCPLUS  
 CN Phosphate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)



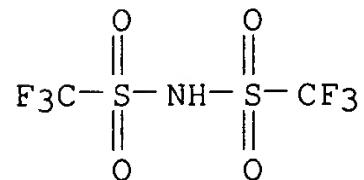
● Li<sup>+</sup>

RN 33454-82-9 HCPLUS  
 CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 90076-65-6 HCPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



● Li

L30 ANSWER 4 OF 5 HCPLUS COPYRIGHT 2006 ACS on STN  
 AN 2002:84081 HCPLUS  
 DN 136:137403  
 TI Electrolyte for a lithium-sulfur battery  
 IN Hwang, Duckchul; Choi, Yunsuk; Choi, Sooseok  
   ; Lee, Jeawoan; Jung, Yongju; Kim, Joosoak  
 PA Samsung SDI Co. Ltd., S. Korea  
 SO Eur. Pat. Appl., 7 pp.

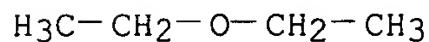
CODEN: EPXXDW

DT Patent

LA English

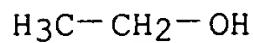
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1176659	A2	20020130	EP 2001-117661	20010725 <--
	EP 1176659	A3	20060531		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
	KR 2002008704	A	20020131	KR 2000-42736	20000725 <--
	KR 2002008705	A	20020131	KR 2000-42737	20000725 <--
	JP 2002075447	A2	20020315	JP 2001-213435	20010713 <--
	US 2002102466	A1	<u>20020801</u>	US 2001- <u>910952</u>	20010724 <--
	CN 1335653	A	20020213	CN 2001-132526	20010725 <--
	PRAI	KR 2000-42736	A	20000725 <--	
		KR 2000-42737	A	20000725 <--	
AB	An electrolyte for a lithium-sulfur battery has a solvent having a dielectric constant that is greater than or equal to 20, a solvent having a viscosity that is less than or equal to 1.3, and an electrolyte salt. This battery shows excellent capacity and cycle life characteristics..				
IT	60-29-7, Ethyl ether, uses 64-17-5, Ethanol, uses 67-56-1, Methanol, uses 67-63-0, Isopropanol, uses 67-68-5, Dmso, uses 68-12-2, Dmf, uses 71-43-2 , Benzene, uses 75-05-8, Acetonitrile, uses 78-93-3, Methylethyl ketone, uses 96-48-0, $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 107-31-3, Methyl formate 108-32-7, Propylene carbonate 109-60-4, n-Propyl acetate 110-82-7, Cyclohexane, uses 110-86-1, Pyridine, uses 123-91-1, p-Dioxane, uses 126-33-0, Sulfolane 462-06-6, Fluorobenzene 623-53-0, Ethylmethyl carbonate 680-31-9, Hexamethylphosphoramide, uses 7704-34-9, Sulfur, uses 7791-03-9, Lithium perchlorate 14283-07-9 , Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 25496-08-6, Fluorotoluene 29935-35-1 , Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 90076-65-6 RL: DEV (Device component use); USES (Uses) (electrolyte for lithium-sulfur battery)				
RN	60-29-7 HCPLUS				
CN	Ethane, 1,1'-oxybis- (9CI) (CA INDEX NAME)				



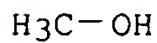
RN 64-17-5 HCPLUS

CN Ethanol (9CI) (CA INDEX NAME)

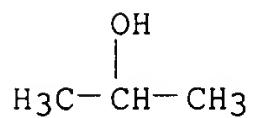


RN 67-56-1 HCPLUS

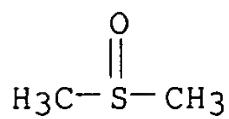
CN Methanol (8CI, 9CI) (CA INDEX NAME)



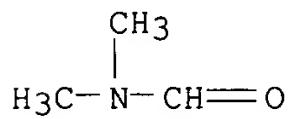
RN 67-63-0 HCPLUS  
 CN 2-Propanol (9CI) (CA INDEX NAME)



RN 67-68-5 HCPLUS  
 CN Methane, sulfinylbis- (9CI) (CA INDEX NAME)



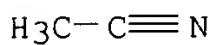
RN 68-12-2 HCPLUS  
 CN Formamide, N,N-dimethyl- (8CI, 9CI) (CA INDEX NAME)



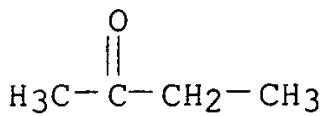
RN 71-43-2 HCPLUS  
 CN Benzene (8CI, 9CI) (CA INDEX NAME)



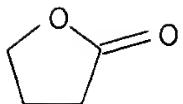
RN 75-05-8 HCPLUS  
 CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



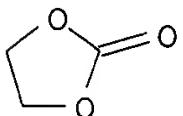
RN 78-93-3 HCPLUS  
 CN 2-Butanone (8CI, 9CI) (CA INDEX NAME)



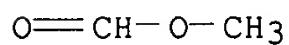
RN 96-48-0 HCPLUS  
 CN 2(3H)-Furanone, dihydro- (8CI, 9CI) (CA INDEX NAME)



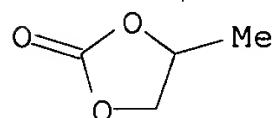
RN 96-49-1 HCAPLUS  
 CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



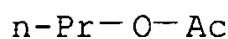
RN 107-31-3 HCAPLUS  
 CN Formic acid, methyl ester (6CI, 8CI, 9CI) (CA INDEX NAME)



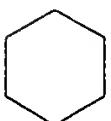
RN 108-32-7 HCAPLUS  
 CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



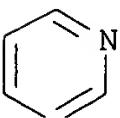
RN 109-60-4 HCAPLUS  
 CN Acetic acid, propyl ester (6CI, 8CI, 9CI) (CA INDEX NAME)



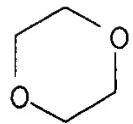
RN 110-82-7 HCAPLUS  
 CN Cyclohexane (8CI, 9CI) (CA INDEX NAME)



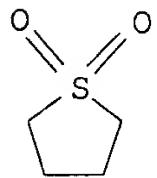
RN 110-86-1 HCAPLUS  
 CN Pyridine (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



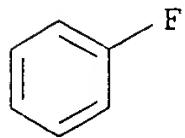
RN 123-91-1 HCAPLUS  
 CN 1,4-Dioxane (9CI) (CA INDEX NAME)



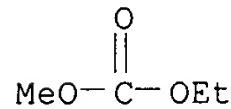
RN 126-33-0 HCAPLUS  
 CN Thiophene, tetrahydro-, 1,1-dioxide (8CI, 9CI) (CA INDEX NAME)



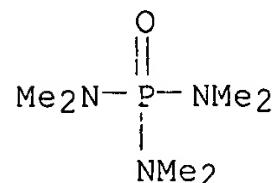
RN 462-06-6 HCAPLUS  
 CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



RN 623-53-0 HCAPLUS  
 CN Carbonic acid, ethyl methyl ester (7CI, 8CI, 9CI) (CA INDEX NAME)



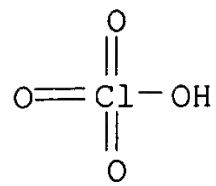
RN 680-31-9 HCAPLUS  
 CN Phosphoric triamide, hexamethyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 7704-34-9 HCAPLUS  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

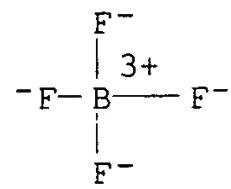
S

RN 7791-03-9 HCAPLUS  
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)

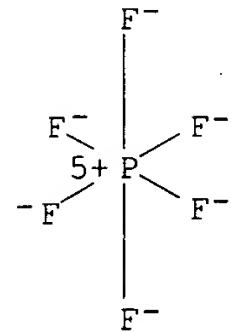


## ● Li

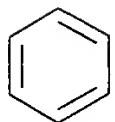
RN 14283-07-9 HCPLUS  
 CN Borate(1-), tetrafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)

●  $\text{Li}^+$ 

RN 21324-40-3 HCPLUS  
 CN Phosphate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)

●  $\text{Li}^+$ 

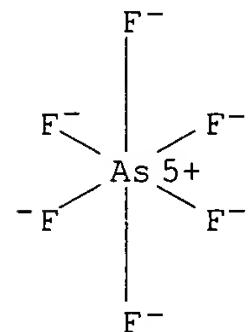
RN 25496-08-6 HCPLUS  
 CN Benzene, fluoromethyl- (9CI) (CA INDEX NAME)



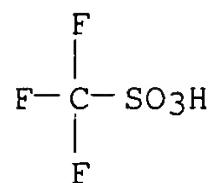
D1-F

D1-Me

RN 29935-35-1 HCPLUS  
 CN Arsenate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)

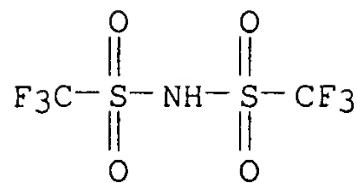
● Li<sup>+</sup>

RN 33454-82-9 HCPLUS  
 CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 90076-65-6 HCPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)

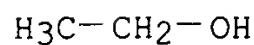


● Li

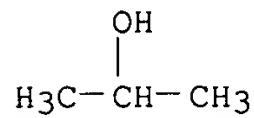
L30 ANSWER 5 OF 5 HCPLUS COPYRIGHT 2006 ACS on STN  
 AN 2002:84080 HCPLUS  
 DN 136:137402  
 TI Electrolyte for a lithium-sulfur battery  
 IN Hwang, Duckchul; Choi, Yunsuk; Choi, Sooseok  
 ; Lee, Jeawoan; Jung, Yongju; Kim, Joosoak  
 PA Samsung SDI Co. Ltd., S. Korea  
 SO Eur. Pat. Appl., 11 pp.  
 CODEN: EPXXDW  
 DT Patent  
 LA English  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1176658	A2	20020130	EP 2001-117642	20010724 <--
	EP 1176658	A3	20060531		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
	KR 2002008703	A	20020131	KR 2000-42735	20000725 <--
	KR 2002014196	A	20020225	KR 2000-47348	20000817 <--
	JP 2002083633	A2	20020322	JP 2001-213414	20010713 <--
	US 2002045101	A1	20020418	US 2001-911083	20010724 <--
	US 6852450	B2	20050208		
	CN 1335652	A	20020213	CN 2001-132525	20010725 <--
PRAI	KR 2000-42735	A	20000725 <--		
	KR 2000-47348	A	20000817 <--		
AB	An electrolyte for a lithium-sulfur battery includes a first component solvent with a sulfur solubility more than or equal to 20 mM, a second component solvent with a sulfur solubility less than 20 mM, a third component solvent with a high dielec. constant and a high viscosity, and an electrolyte salt. This battery shows excellent capacity and cycle life characteristics.				
IT	64-17-5, Ethanol, uses 67-63-0, Isopropanol, uses 71-43-2, Benzene, uses 96-48-0, $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 108-88-3, Toluene, uses 109-60-4, Propyl acetate 110-82-7, Cyclohexane, uses 126-33-0, Sulfolane 462-06-6, Fluorobenzene 623-53-0, Ethylmethyl carbonate 7439-93-2, Lithium, uses 7704-34-9, Sulfur, uses 7704-34-9D, Sulfur, organic compound 7791-03-9, Lithium perchlorate 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 90076-65-6				
	RL: DEV (Device component use); USES (Uses) (electrolyte for lithium-sulfur battery)				
RN	64-17-5 HCPLUS				

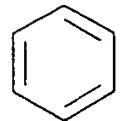
CN Ethanol (9CI) (CA INDEX NAME)



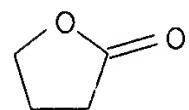
RN 67-63-0 HCPLUS  
 CN 2-Propanol (9CI) (CA INDEX NAME)



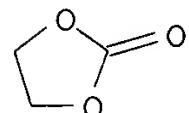
RN 71-43-2 HCPLUS  
 CN Benzene (8CI, 9CI) (CA INDEX NAME)



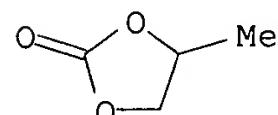
RN 96-48-0 HCPLUS  
 CN 2(3H)-Furanone, dihydro- (8CI, 9CI) (CA INDEX NAME)



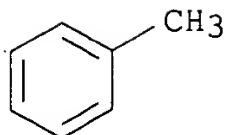
RN 96-49-1 HCPLUS  
 CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



RN 108-32-7 HCPLUS  
 CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



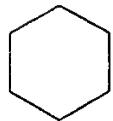
RN 108-88-3 HCPLUS  
 CN Benzene, methyl- (9CI) (CA INDEX NAME)



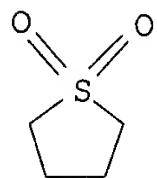
RN 109-60-4 HCPLUS  
 CN Acetic acid, propyl ester (6CI, 8CI, 9CI) (CA INDEX NAME)

n-Pr—O—Ac

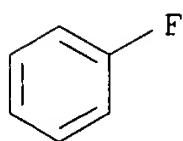
RN 110-82-7 HCPLUS  
 CN Cyclohexane (8CI, 9CI) (CA INDEX NAME)



RN 126-33-0 HCPLUS  
 CN Thiophene, tetrahydro-, 1,1-dioxide (8CI, 9CI) (CA INDEX NAME)



RN 462-06-6 HCPLUS  
 CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



RN 623-53-0 HCPLUS  
 CN Carbonic acid, ethyl methyl ester (7CI, 8CI, 9CI) (CA INDEX NAME)

$\text{MeO} \text{---} \overset{\text{O}}{\underset{\parallel}{\text{C}}} \text{---} \text{OEt}$

RN 7439-93-2 HCPLUS  
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

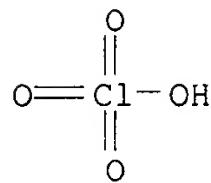
RN 7704-34-9 HCPLUS  
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

RN 7704-34-9 HCPLUS  
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

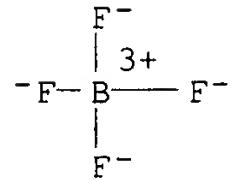
S

RN 7791-03-9 HCPLUS  
CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



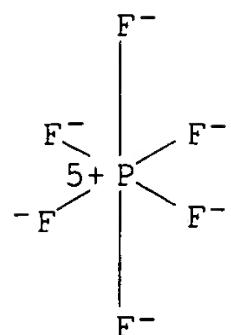
● Li

RN 14283-07-9 HCPLUS  
CN Borate(1-), tetrafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)



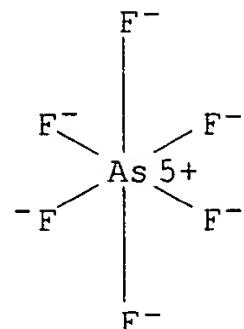
● Li<sup>+</sup>

RN 21324-40-3 HCPLUS  
CN Phosphate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)



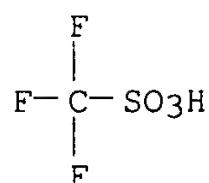
● Li<sup>+</sup>

RN 29935-35-1 HCPLUS  
 CN Arsenate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)



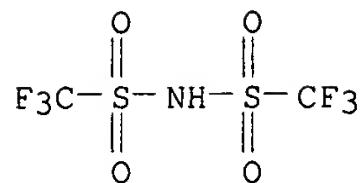
● Li<sup>+</sup>

RN 33454-82-9 HCPLUS  
 CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 90076-65-6 HCPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



● Li

=> d 131 bib abs hitstr retable tot

L31 ANSWER 2 OF 28 HCPLUS COPYRIGHT 2006 ACS on STN  
AN 2002:658414 HCPLUS  
DN 137:188262  
TI Electrolytes with strong oxidizing additives for lithium/sulfur batteries  
IN Chu, May-Ying; Nimon, Yevgeniy S.; Visco, Steven J.  
PA Polyplus Battery Company, USA  
SO PCT Int. Appl., 54 pp.  
CODEN: PIXXD2  
DT Patent  
LA English  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002067344	A2	20020829	WO 2002-US4274	20020213 <--
	WO 2002067344	A3	20050203		
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
	US 6632573	B1	20031014	US 2001-789379	<u>20010220</u> <--
	AU 2002306483	A1	20020904	AU 2002-306483	20020213 <--
	US 2004081894	A1	20040429	US 2003-645193	20030820 <--
PRAI	US 2001-789379	A	20010220	<--	
	WO 2002-US4274	W	20020213		
OS	MARPAT 137:188262				
AB	Disclosed are oxidizer-treated lithium electrodes, battery cells containing such oxidizer-treated lithium electrodes, battery cell electrolytes containing oxidizing additives, and methods of treating lithium electrodes with oxidizing agents and battery cells containing such oxidizer-treated lithium electrodes. Battery cells containing SO <sub>2</sub> as an electrolyte additive in accordance with the present invention exhibit higher discharge capacities after cell storage over cells not containing SO <sub>2</sub> . Pre-treating the lithium electrode with SO <sub>2</sub> gas prior to battery assembly prevented cell polarization. Moreover, the SO <sub>2</sub> treatment does not neg. impact sulfur utilization and improves the lithium's electrochem. function as the neg. electrode in the battery cell.				
IT	67-68-5, Dmso, uses 68-12-2, Dmf, uses 110-86-1				

2nd

weiner - 09 / 910952

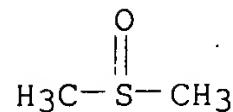
Page 26

, Pyridine, uses 680-31-9, Hexamethylphosphoramide, uses  
7439-93-2, Lithium, uses 7439-93-2D, Lithium,  
intercalation compound 7704-34-9, Sulfur, uses 7704-34-9D  
, Sulfur, organic compound 7791-03-9, Lithium perchlorate  
14283-07-9, Lithium tetrafluoroborate 21324-40-3,  
Lithium hexafluorophosphate 29935-35-1, Lithium  
hexafluoroarsenate 33454-82-9, Lithium triflate  
90076-65-6

RL: DEV (Device component use); USES (Uses)  
(electrolytes with strong oxidizing additives for lithium/sulfur  
batteries)

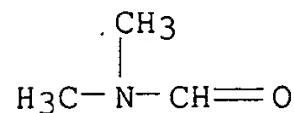
RN 67-68-5 HCPLUS

CN Methane, sulfinylbis- (9CI) (CA INDEX NAME)



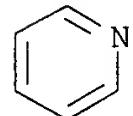
RN 68-12-2 HCPLUS

CN Formamide, N,N-dimethyl- (8CI, 9CI) (CA INDEX NAME)



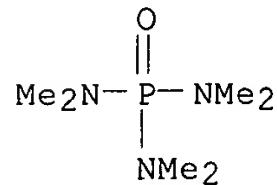
RN 110-86-1 HCPLUS

CN Pyridine (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



RN 680-31-9 HCPLUS

CN Phosphoric triamide, hexamethyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 7439-93-2 HCPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

RN 7439-93-2 HCPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

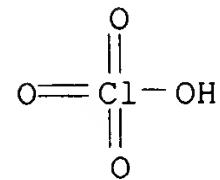
RN 7704-34-9 HCPLUS  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

RN 7704-34-9 HCPLUS  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

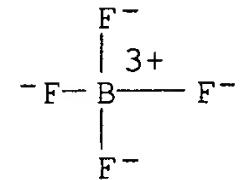
S

RN 7791-03-9 HCPLUS  
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)

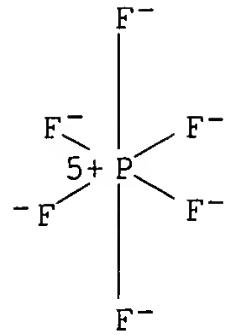


● Li

RN 14283-07-9 HCPLUS  
 CN Borate(1-), tetrafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)

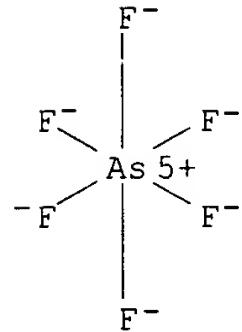
● Li<sup>+</sup>

RN 21324-40-3 HCPLUS  
 CN Phosphate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)



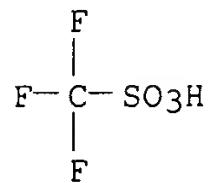
● Li<sup>+</sup>

RN 29935-35-1 HCPLUS  
 CN Arsenate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)



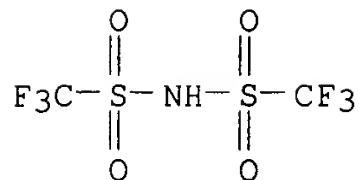
● Li<sup>+</sup>

RN 33454-82-9 HCPLUS  
 CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 90076-65-6 HCPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



● Li

L31 ANSWER 3 OF 28 HCPLUS COPYRIGHT 2006 ACS on STN  
 AN 2002:444410 HCPLUS

DN 137:8649

TI Cathode current collector for electrochemical cells

IN Roach, Joseph M.

PA Moltech Corporation, USA

SO U.S., 11 pp.

CODEN: USXXAM

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6403263	B1	20020611	US 2000-668706	<u>20000920</u> <--
PRAI	US 2000-668706			20000920	<--

AB Provided are cathode current collectors for use in electrochem. cells, wherein the current collector comprises a conductive primer layer applied upon a conductive support, and the primer layer comprises from about 25 to 70% by weight of a crosslinked polymeric material formed from a reaction of a polyvinyl acetal and a crosslinking agent, and about 30 to 75% by weight of a conductive filler. The present invention also pertains to methods of forming such cathode current collectors for use in electrochem. cells comprising (i) an anode comprising lithium, and (ii) a cathode comprising an electroactive sulfur-containing material.

IT 7439-93-2, Lithium, uses 7704-34-9, Sulfur, uses

RL: DEV (Device component use); USES (Uses)  
 (cathode current collector for electrochem. cells)

RN 7439-93-2 HCPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

RN 7704-34-9 HCPLUS

CN Sulfur (8CI, 9CI) (CA INDEX NAME)

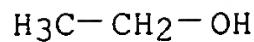
S

IT 64-17-5, Ethanol, uses 78-93-3, Ethyl methyl ketone,  
 uses

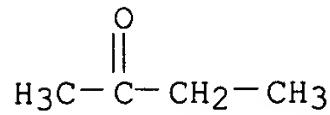
RL: TEM (Technical or engineered material use); USES (Uses)  
 (cathode current collector for electrochem. cells)

RN 64-17-5 HCPLUS

CN Ethanol (9CI) (CA INDEX NAME)



RN 78-93-3 HCAPLUS  
 CN 2-Butanone (8CI, 9CI) (CA INDEX NAME)



## RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Alamgir	1994		93	Lithium Batteries, N	HCAPLUS
Anon	1999			WO 9933125	HCAPLUS
Anon	2000			WO 0036674	HCAPLUS
Anon	2000			WO 0036678	HCAPLUS
Armand	1988			US 4739018 A	HCAPLUS
Bagley	1993			US 5194341 A	HCAPLUS
Carlson	2000			US 6153337 A	HCAPLUS
Chaloner-Gill	1995			US 5399447 A	HCAPLUS
Chaloner-Gill	1996			US 5520850 A	HCAPLUS
Chassar	2000			US 6069221 A	HCAPLUS
de Jonghe	1989			US 4833048 A	HCAPLUS
de Jonghe	1990			US 4917974 A	HCAPLUS
Dominey	1994		137	Lithium Batteries, N	HCAPLUS
Fauteux	1996			US 5578396 A	
Fauteux	1996			US 5588971 A	
Fauteux	1997			US 5591544 A	
Gorkovenko	2001			US 6201100 B1	HCAPLUS
Lee	1996			US 5538812 A	HCAPLUS
McEwen	1999			US 5973913 A	HCAPLUS
Moulton	1995			US 5441830 A	HCAPLUS
Moulton	1995			US 5464707 A	HCAPLUS
Naoi	1998			US 5723230 A	HCAPLUS
Naoi	1998			US 5783330 A	HCAPLUS
Naoi	1998			US 5792575 A	HCAPLUS
Naoi	1999			US 5882819 A	HCAPLUS
Olsen	1996			US 5518839 A	HCAPLUS
Oyama	1994			US 5324599 A	HCAPLUS
Perichaud	1987			US 4664991 A	HCAPLUS
Skotheim	1996			US 5529860 A	HCAPLUS
Skotheim	1997			US 5601947 A	HCAPLUS
Skotheim	1997			US 5690702 A	HCAPLUS
Skotheim	2000			US 6117590 A	HCAPLUS
Spillman	1999			US 5935724 A	HCAPLUS
Spillman	1999			US 5935728 A	HCAPLUS
Touhsaent	1998			US 5827615 A	HCAPLUS
Tsukahara	2000			US 6048637 A	
Turi	1995			US 5478676 A	HCAPLUS
Visco	1992			US 5162175 A	HCAPLUS
Visco	1996			US 5516598 A	HCAPLUS
Xu	2001			US 6302928 B1	HCAPLUS

AN 2002:66770 HCPLUS  
 DN 136:121064  
 TI Nonaqueous electrolyte lithium secondary battery  
 IN Iwamoto, Kazuyu; Oura, Takafumi; Hatazaki, Makino; Yoshizawa, Hiroshi;  
 Sonoda, Kumiko; Nakanishi, Shinji  
 PA Matsushita Electric Industrial Co., Ltd., Japan  
 SO Eur. Pat. Appl., 31 pp.  
 CODEN: EPXXDW

DT Patent  
 LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1174940	A1	20020123	EP 2001-117048	20010712 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2002033119	A2	20020131	JP 2000-215518	20000717 <--
	JP 2002033120	A2	20020131	JP 2000-215519	20000717 <--
	JP 2002033124	A2	20020131	JP 2000-215520	20000717 <--
	US 2002039677	A1	20020404	US 2001-901130	<u>20010710</u> <--
	US 6958198	B2	20051025		
	CN 1333580	A	20020130	CN 2001-123135	20010717 <--
PRAI	JP 2000-215518	A	20000717	<--	
	JP 2000-215519	A	20000717	<--	
	JP 2000-215520	A	20000717	<--	

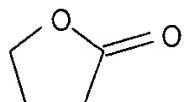
AB The invention relates to a nonaq. electrochem. apparatus in which the difference ( $\gamma_l - \gamma_{se}$ ) between the surface tension  $\gamma_l$  of nonaq. electrolyte and the surface free energy  $\gamma_{se}$  of electrode is not more than 10 dynes/cm. The nonaq. electrolyte contains a F-containing surface active agent.

IT 96-48-0,  $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 109-60-4, n-Propyl acetate 623-53-0, Ethylmethyl carbonate 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 90076-65-6

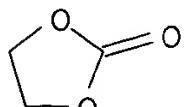
RL: DEV (Device component use); USES (Uses)  
 (nonaq. electrolyte lithium secondary battery)

RN 96-48-0 HCPLUS

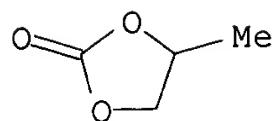
CN 2(3H)-Furanone, dihydro- (8CI, 9CI) (CA INDEX NAME)



RN 96-49-1 HCPLUS  
 CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



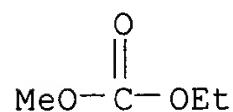
RN 108-32-7 HCPLUS  
 CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



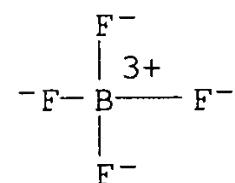
RN 109-60-4 HCPLUS  
 CN Acetic acid, propyl ester (6CI, 8CI, 9CI) (CA INDEX NAME)

n-Pr-O-Ac

RN 623-53-0 HCPLUS  
 CN Carbonic acid, ethyl methyl ester (7CI, 8CI, 9CI) (CA INDEX NAME)

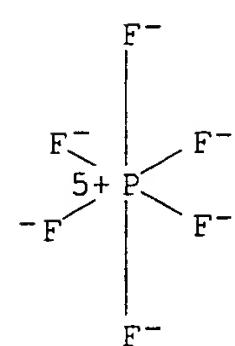


RN 14283-07-9 HCPLUS  
 CN Borate(1-), tetrafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)



● Li<sup>+</sup>

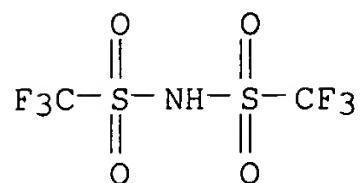
RN 21324-40-3 HCPLUS  
 CN Phosphate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)



● Li<sup>+</sup>

RN 90076-65-6 HCPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-,

lithium salt (9CI) (CA INDEX NAME)

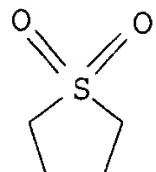


● Li

IT 126-33-0, Sulfolane 7704-34-9D, Sulfur, ester  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (nonaq. electrolyte lithium secondary battery)

RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (8CI, 9CI) (CA INDEX NAME)



RN 7704-34-9 HCAPLUS

CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

## RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	1992	016	P-1450	PATENT ABSTRACTS OF	
Anon	1996	1996		PATENT ABSTRACTS OF	
Anon	1997	1997		PATENT ABSTRACTS OF	
Anon	1997	1997		PATENT ABSTRACTS OF	
Anon	1997	1997		PATENT ABSTRACTS OF	
Anon	1998	1998		PATENT ABSTRACTS OF	
Anon	2000	2000		PATENT ABSTRACTS OF	
Anon	2000	2000		PATENT ABSTRACTS OF	
Anon	2001	2000		PATENT ABSTRACTS OF	
Asahi Chem Ind Co Ltd	1997			JP 09106834 A	HCAPLUS
Brodd, R	1994			US 5358801 A	HCAPLUS
Buerge	1999			WO 9916138 A	HCAPLUS
Centre Nat Etd Spatiale	1994			FR 2704099 A	HCAPLUS
Denso Corp	1999			JP 11354104 A	HCAPLUS
Hitachi Ltd	1997			JP 09092280 A	HCAPLUS
Japan Storage Battery C	2001			JP 2001060464 A	HCAPLUS
Matsushita Electric Ind	1991			EP 0457354 A	HCAPLUS
Minnesota Mining & Mfg	1999			WO 9930381 A	HCAPLUS
Sanyo Electric Co Ltd	1997			JP 09161844 A	HCAPLUS
Sanyo Electric Co.Ltd	1997			JP 09306539 A	HCAPLUS
Shin Kobe Electric Mach	2000			JP 2000082471 A	HCAPLUS

Sony Corp	1995	J P 07282851 A	HCAPLUS
Tonen Corp	1992	J P 04204522 A	HCAPLUS

L31 ANSWER 6 OF 28 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 2000:553814 HCAPLUS

DN 133:137869

TI Dioxolane as a protector for lithium battery anodes

IN Nimon, Yevgeniy S.; Visco, Steven J.; Chu, May-Ying

PA Polyplus Battery Company, Inc., USA

SO PCT Int. Appl., 50 pp.

CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2000046870	A1	<u>20000810</u>	WO 2000-US2732	20000204 <--
				W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG	

PRAI US 1999-245167 A 19990205 <--

OS MARPAT 133:137869

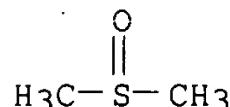
AB Disclosed are dioxolane-treated lithium electrodes, battery cells containing such dioxolane-treated lithium electrodes, battery cell electrolytes containing dioxolane, and methods of treating lithium electrodes with dioxolane. Treating lithium with dioxolane prevents the lithium from reacting with a wide range of substances which can contaminate battery cells, particularly moisture and other protic impurities, that might otherwise react with lithium to the detriment of its function as a neg. electrode in a battery. Battery cells containing dioxolane as an electrolyte co-solvent in accordance with the present invention exhibit improved cycling performance over cells not containing dioxolane. Moreover, the dioxolane treatment does not neg. impact sulfur utilization and improves the lithium's electrochem. function as the neg. electrode in a battery.

IT 67-68-5, Dmso, uses 68-12-2, uses 110-86-1,  
 Pyridine, uses 680-31-9, Hexamethylphosphoramide, uses  
 7439-93-2, Lithium, uses 7439-93-2D, Lithium,  
 intercalation compound, uses 7704-34-9, Sulfur, uses  
 7791-03-9, Lithium perchlorate 14283-07-9, Lithium  
 tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate  
 29935-35-1, Lithium hexafluoroarsenate 33454-82-9,  
 Lithium triflate 90076-65-6

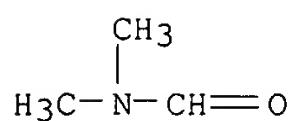
RL: DEV (Device component use); USES (Uses)  
 (dioxolane as a protector for lithium battery anodes)

RN 67-68-5 HCAPLUS

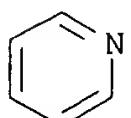
CN Methane, sulfinylbis- (9CI) (CA INDEX NAME)



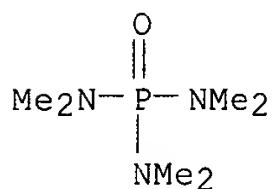
RN 68-12-2 HCAPLUS  
 CN Formamide, N,N-dimethyl- (8CI, 9CI) (CA INDEX NAME)



RN 110-86-1 HCAPLUS  
 CN Pyridine (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



RN 680-31-9 HCAPLUS  
 CN Phosphoric triamide, hexamethyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 7439-93-2 HCAPLUS  
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

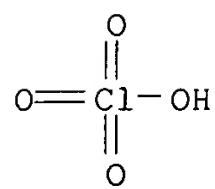
RN 7439-93-2 HCAPLUS  
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

RN 7704-34-9 HCAPLUS  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

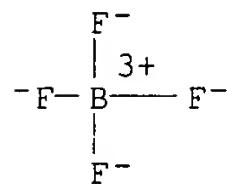
S

RN 7791-03-9 HCAPLUS  
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



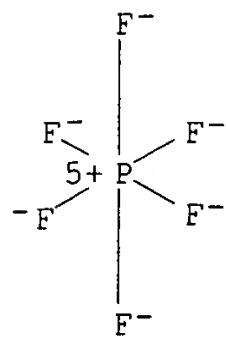
● Li

RN 14283-07-9 HCPLUS  
 CN Borate(1-), tetrafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)



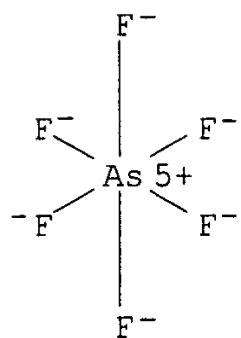
●  $\text{Li}^+$

RN 21324-40-3 HCPLUS  
 CN Phosphate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)

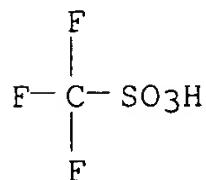


●  $\text{Li}^+$

RN 29935-35-1 HCPLUS  
 CN Arsenate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)

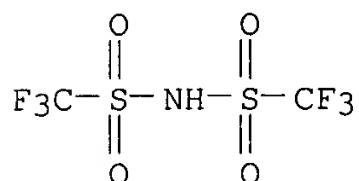
● Li<sup>+</sup>

RN 33454-82-9 HCPLUS  
 CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



## ● Li

RN 90076-65-6 HCPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



## ● Li

## RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Bolster	1997			US 5691083 A	HCPLUS
Chu	2000			US 6030720 A	HCPLUS
Dan	1997			GB 2311410 A	
Dey	1976			US 3947289 A	HCPLUS
Nimon	2000			US 6017651 A	HCPLUS
Peled	1983			US 4410609 A	HCPLUS
Peled, E	1989	136	1621	IJ Electrochem Soc	HCPLUS

L31 ANSWER 7 OF 28 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2000:421456 HCAPLUS  
 DN 133:32706  
 TI Nonaqueous electrolytes for batteries  
 IN Mikhaylik, Yuriy V.; Skotheim, Terje A.; Gorkovenko, Alexander A.  
 PA Moltech Corp., USA  
 SO PCT Int. Appl., 51 pp.  
 CODEN: PIXXD2

DT Patent  
 LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2000036683	A2	20000622	WO 1999-US30116	19991216 <--
	WO 2000036683	A3	20001109		
				W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG	
	EP 1149428	A2	20011031	EP 1999-967390	19991216 <--
	EP 1149428	B1	20030319		
				R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO	
PRAI	US 1998-215115	A2	19981217 <--		
	WO 1999-US30116	W	19991216 <--		

AB The present invention relates generally to the field of nonaq. electrolytes for use in elec. current producing cells. More particularly, the present invention pertains to nonaq. electrolytes comprising a highly concentrated solution of one or more lithium salts in one or more nonaq. solvents.

More specifically, the present invention pertains to nonaq. electrolytes, suitable for use in an elec. current producing cell, comprising: (a) one or more lithium salts, dissolved in (b) one or more nonaq. oxygen-containing solvents; wherein the concentration of the one or more lithium salts is: (i) >110% of the molar concentration of the one or more lithium salts which would provide maximum ionic conductivity at 25° in the one or more solvents; and, (ii) >1.3M. The present invention also pertains to elec. current producing cells comprising such nonaq. electrolytes, and methods for increasing the safety and cycle life of an elec. current producing cell.

IT 7439-93-2, Lithium, uses 7704-34-9, Sulfur, uses  
 RL: DEV (Device component use); USES (Uses)  
 (nonaq. electrolytes for batteries)

RN 7439-93-2 HCPLUS  
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

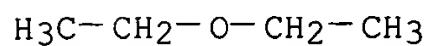
RN 7704-34-9 HCPLUS  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

IT 60-29-7, Diethyl ether, uses 123-91-1, 1,4-Dioxane, uses  
 126-33-0 33454-82-9, Lithium triflate ~~90076-65-6~~  
 RL: DEV (Device component use); TEM (Technical or engineered material  
 use); USES (Uses)  
 (nonaq. electrolytes for batteries)

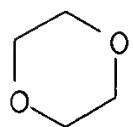
RN 60-29-7 HCAPLUS

CN Ethane, 1,1'-oxybis- (9CI) (CA INDEX NAME)



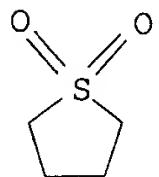
RN 123-91-1 HCAPLUS

CN 1,4-Dioxane (9CI) (CA INDEX NAME)



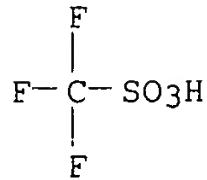
RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (8CI, 9CI) (CA INDEX NAME)



RN 33454-82-9 HCAPLUS

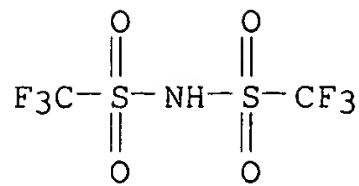
CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

RN 90076-65-6 HCAPLUS

CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-,  
 lithium salt (9CI) (CA INDEX NAME)



● Li

L31 ANSWER 8 OF 28 HCPLUS COPYRIGHT 2006 ACS on STN  
 AN 2000:141485 HCPLUS  
 DN 132:168757  
 TI Liquid electrolyte lithium-sulfur batteries  
 IN Chu, May-Ying; De Jonghe, Lutgard C.; Visco, Steven J.; Katz, Bruce D.  
 PA Polyplus Battery Co., Inc., USA  
 SO U.S., 28 pp., Cont.-in-part of U.S. 5,686,201  
 CODEN: USXXAM  
 DT Patent  
 LA English  
 FAN.CNT 15

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6030720	A	20000229	US 1997-948969	19971010 <--
	US 5523179	A	19960604	US 1994-344384	19941123 <--
	US 5582623	A	19961210	US 1995-479687	19950607 <--
	US 5686201	A	19971111	US 1996-686609	19960726 <--
	CA 2305454	AA	19990422	CA 1998-2305454	19981006 <--
	WO 9919931	A1	19990422	WO 1998-US21067	19981006 <--
	W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	AU 9896876	A1	19990503	AU 1998-96876	19981006 <--
	AU 741815	B2	20011213		
	EP 1021849	A1	20000726	EP 1998-950967	19981006 <--
	EP 1021849	B1	20030122		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	BR 9812749	A	20000829	BR 1998-12749	19981006 <--
	JP 2001520447	T2	20011030	JP 2000-516392	19981006 <--
	AT 231653	E	20030215	AT 1998-950967	19981006 <--
	US 6358643	B1	20020319	US 2000-495639	20000201 <--
PRAI	US 1994-344384	A2	19941123	<--	
	US 1995-479687	A2	19950607	<--	
	US 1996-686609	A2	19960726	<--	
	US 1997-948969	A	19971010	<--	
	WO 1998-US21067	W	19981006	<--	
OS	MARPAT 132:168757				
AB	Disclosed are electrolyte solvents for ambient-temperature lithium-sulfur batteries. The disclosed solvents include at least one ethoxy repeating unit compound of the general formula R1(CH <sub>2</sub> CH <sub>2</sub> O) <sub>n</sub> R2, where n ranges between 2 and 10 and R1 and R2 are different or identical alkyl or alkoxy groups				

(including substituted alkyl or alkoxy groups). Alternatively, R1 and R2 may together with  $(CH_2CH_2O)_n$  form a closed ring. Examples of linear solvents include the glymes  $(CH_3O(CH_2CH_2)_nCH_3)$ . Some electrolyte solvents include a donor or acceptor solvent in addition to an ethoxy compound as described. Examples of donor solvents include hexamethylphosphoramide, pyridine, N,N-diethylacetamide, N,N-diethylformamide, dimethylsulfoxide, tetramethylurea, N,N-dimethylacetamide, N,N-dimethylformamide, tributylphosphate, trimethylphosphate, N,N,N',N'-tetraethylsulfamide, tetramethylenediamine, tetramethylpropylenediamine, and pentamethyldiethylenetriamine. These assist in solvation of lithium ions. Examples of acceptor solvents include alcs., glycols, and polyglycols. These assist in solvation of the sulfide and polysulfide anions.

IT 7439-93-2, Lithium, uses 7439-93-2D, Lithium, intercalation compound, uses 7704-34-9, Sulfur, uses 90076-65-6

RL: DEV (Device component use); USES (Uses)  
(liquid electrolyte lithium-sulfur batteries)

RN 7439-93-2 HCPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

RN 7439-93-2 HCPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

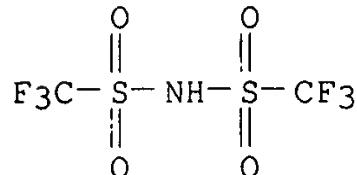
RN 7704-34-9 HCPLUS

CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

RN 90076-65-6 HCPLUS

CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME)



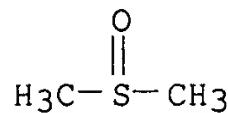
● Li

IT 67-56-1, Methanol, uses 67-68-5, Dimethylsulfoxide, uses 68-12-2, N,N-Dimethylformamide, uses 110-86-1, Pyridine, uses 680-31-9, Hexamethylphosphoramide, uses RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
(liquid electrolyte lithium-sulfur batteries)

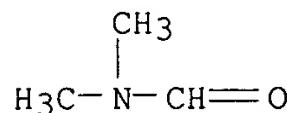
RN 67-56-1 HCAPLUS  
 CN Methanol (8CI, 9CI) (CA INDEX NAME)



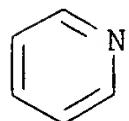
RN 67-68-5 HCAPLUS  
 CN Methane, sulfinylbis- (9CI) (CA INDEX NAME)



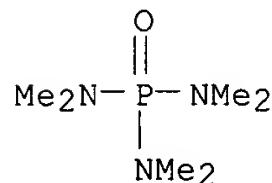
RN 68-12-2 HCAPLUS  
 CN Formamide, N,N-dimethyl- (8CI, 9CI) (CA INDEX NAME)



RN 110-86-1 HCAPLUS  
 CN Pyridine (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



RN 680-31-9 HCAPLUS  
 CN Phosphoric triamide, hexamethyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



## RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	1972			FR 2124388	HCAPLUS
Anon	1982			GB 2084391	HCAPLUS
Anon	1984			GB 2273603 A	HCAPLUS
Anon	1994			EP 0602984 A2	HCAPLUS
Anon	1994			JP 06275313	HCAPLUS
Anon	1994			GB 2137406 A	HCAPLUS
Bennett	1984			US 4469761	HCAPLUS
Chang	1979			US 4143214	HCAPLUS
de Jonghe	1990			US 4917974	HCAPLUS
Dejonghe	1989			US 4833048	HCAPLUS

Dey	1974		US 3806369	
Farrington	1976		US 3953231	HCAPLUS
Farrington	1981		US 4268587	HCAPLUS
Kummer	1968		US 3404035	HCAPLUS
Kummer	1968		US 3413150	HCAPLUS
Lauck	1975		US 3907591	HCAPLUS
Lauck	1975		US 3915743	HCAPLUS
Nishimura	1977		US 4008357	HCAPLUS
Nole	1970		US 3532543	HCAPLUS
Peled	1983		US 4410609	HCAPLUS
Perichaud	1987		US 4644911	
Soffer	1979		US 4132837	HCAPLUS
Toshiba, S	1997	42	1019   Electrochimica Acta	
Wilkinson	1992		US 5130211	HCAPLUS

L31 ANSWER 9 OF 28 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1999:566293 HCAPLUS

DN 131:172706

TI Method for producing membrane of gel composite electrolyte for batteries

IN Yamamoto, Tetsu; Murata, Makoto

PA Aventis Research and Technologies GmbH and Co. KG, Germany

SO PCT Int. Appl., 22 pp.

CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9944247	A1	19990902	WO 1999-JP834	19990224 <--
	W: CA, JP, KR, US				
	RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, NL, PT				
	CA 2318835	AA	19990902	CA 1999-2318835	19990224 <--
	EP 1058951	A1	20001213	EP 1999-906463	19990224 <--
	EP 1058951	B1	20030604		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, PT, IE, FI				
	JP 2002510120	T2	20020402	JP 2000-533912	19990224 <--
	AT 242549	E	20030615	AT 1999-906463	19990224 <--
PRAI	JP 1998-43059	A	19980225	<--	
	WO 1999-JP834	W	19990224	<--	

AB A method is provided for the production of a membrane of gel composite electrolyte having a uniform membrane thickness. The method has the steps of: mixing a lithium salt, an electrolyte solvent having a b.p. at one atmospheric pressure of not less than 240° and a diluting solvent having a b.p. at one atmospheric pressure of from 40° to 210° to obtain an electrolyte solution; mixing the electrolyte solution with a gelling agent to obtain a gel composite electrolyte; shaping the gel composite electrolyte into a membrane configuration; and removing the diluting solvent from the gel composite electrolyte. The method is characterized by the use of a diluting solvent. The diluting solvent facilitates the shaping step, thereby producing an electrolyte membrane having a uniform thickness. The gelling agent may be fumed silica.

IT 7439-93-2D, Lithium, salt, uses 33454-82-9, Lithium trifluoromethanesulfonate

RL: DEV (Device component use); USES (Uses)

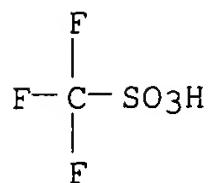
(method for producing membrane of gel composite electrolyte for batteries)

RN 7439-93-2 HCAPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

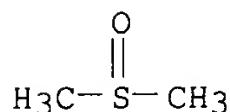
Li

RN 33454-82-9 HCPLUS  
 CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)

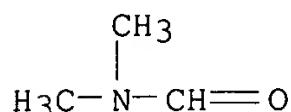


● Li

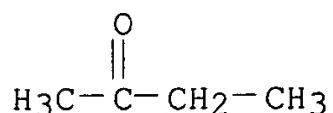
IT 67-68-5, Dmso, uses 68-12-2, uses 78-93-3,  
 2-Butanone, uses 96-48-0 108-32-7, Propylene carbonate  
**7704-34-9D**, Sulfur, compound, uses  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (method for producing membrane of gel composite electrolyte for  
 batteries)  
 RN 67-68-5 HCPLUS  
 CN Methane, sulfinylbis- (9CI) (CA INDEX NAME)



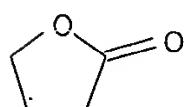
RN 68-12-2 HCPLUS  
 CN Formamide, N,N-dimethyl- (8CI, 9CI) (CA INDEX NAME)



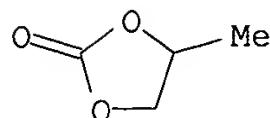
RN 78-93-3 HCPLUS  
 CN 2-Butanone (8CI, 9CI) (CA INDEX NAME)



RN 96-48-0 HCPLUS  
 CN 2(3H)-Furanone, dihydro- (8CI, 9CI) (CA INDEX NAME)



RN 108-32-7 HCAPLUS  
 CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



RN 7704-34-9 HCAPLUS  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Anon	1997	144	399	Journal of the Elect	
Arnold, C	1997			US 5691080 A	HCAPLUS
Bell Communications Res	1995			WO 9531835 A	HCAPLUS
Fan, J	1998			WO 9859388 A	HCAPLUS
Gozdz, A	1994			US 5296318 A	HCAPLUS
Matsuo, Y	1995	79	295	Solid State Ionics	HCAPLUS
Polyplus Battery Co Inc	1996			WO 9616450 A	HCAPLUS
Varta Batterie	1991			EP 0416243 A	HCAPLUS

L31 ANSWER 10 OF 28 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1999:271600 HCAPLUS

DN 130:284490

TI Liquid electrolyte lithium-sulfur batteries

IN Chu, May-Ying; De Jonghe, Lutgard C.; Visco, Steven J.; Katz, Bruce D.

PA Polyplus Battery Company, Inc., USA

SO PCT Int. Appl., 57 pp.

CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 15

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9919931	A1	19990422	WO 1998-US21067	19981006 <--
	W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW				
	RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
US	6030720	A	20000229	US 1997-948969	19971010 <--
CA	2305454	AA	19990422	CA 1998-2305454	19981006 <--
AU	9896876	A1	19990503	AU 1998-96876	19981006 <--
AU	741815	B2	20011213		
EP	1021849	A1	20000726	EP 1998-950967	19981006 <--
EP	1021849	B1	20030122		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
BR	9812749	A	20000829	BR 1998-12749	19981006 <--

JP 2001520447	T2	20011030	JP 2000-516392	19981006 <--
AT 231653	E	20030215	AT 1998-950967	19981006 <--
PRAI US 1997-948969	A	19971010	<--	
US 1994-344384	A2	19941123	<--	
US 1995-479687	A2	19950607	<--	
US 1996-686609	A2	19960726	<--	
WO 1998-US21067	W	19981006	<--	
OS MARPAT 130:284490				
AB Disclosed are electrolyte solvents for ambient-temperature lithium-sulfur batteries. The disclosed solvents include at least one ethoxy repeating unit compound of the general formula R1(CH <sub>2</sub> CH <sub>2</sub> O) <sub>n</sub> R2, where n ranges between 2 and 10 and R1 and R2 are different or identical alkyl or alkoxy groups (including substituted alkyl or alkoxy groups). Alternatively, R1 and R2 may together with (CH <sub>2</sub> CH <sub>2</sub> O) <sub>n</sub> form a closed ring. Examples of linear solvents include the glymes (CH <sub>3</sub> O(CH <sub>2</sub> CH <sub>2</sub> ) <sub>n</sub> CH <sub>3</sub> ). Some electrolyte solvents include a donor or acceptor solvent in addition to an ethoxy compound as described. Examples of donor solvents include hexamethylphosphoramide, pyridine, N,N-diethylacetamide, N,N-diethylformamide, dimethylsulfoxide, tetramethylurea, N,N-dimethylacetamide, N,N-dimethylformamide, tributylphosphate, trimethylphosphate, N,N,N',N'-tetraethylsulfamide, tetramethylenediamine, tetramethylpropylenediamine, and pentamethyldiethylenetriamine. These assist in solvation of lithium ions. Examples of acceptor solvents include alcs., glycols, and polyglycols. These assist in solvation of the sulfide and polysulfide anions.				
IT 7439-93-2, Lithium, uses 7439-93-2D, Lithium, intercalation compound, uses 7704-34-9, Sulfur, uses 7791-03-9, Lithium perchlorate 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 90076-65-6				
RL: DEV (Device component use); USES (Uses) (liquid electrolyte lithium-sulfur batteries)				
RN 7439-93-2 HCPLUS				
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)				

## Li

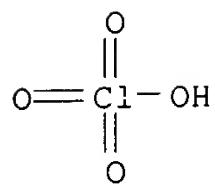
RN 7439-93-2 HCPLUS				
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)				

## Li

RN 7704-34-9 HCPLUS				
CN Sulfur (8CI, 9CI) (CA INDEX NAME)				

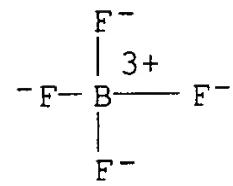
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RN 7791-03-9 HCPLUS				
CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)				

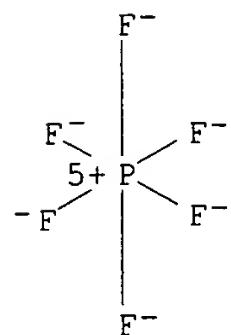


## ● Li

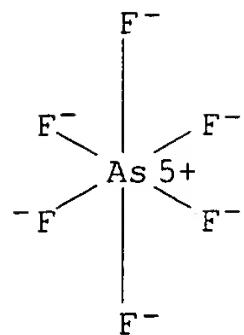
RN 14283-07-9 HCPLUS  
 CN Borate(1-), tetrafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)

● Li<sup>+</sup>

RN 21324-40-3 HCPLUS  
 CN Phosphate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)

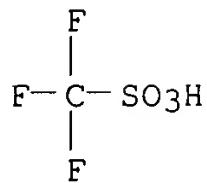
● Li<sup>+</sup>

RN 29935-35-1 HCPLUS  
 CN Arsenate(1-), hexafluoro-, lithium (8CI, 9CI) (CA INDEX NAME)



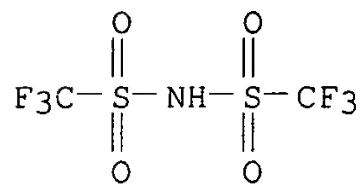
● Li<sup>+</sup>

RN 33454-82-9 HCPLUS  
 CN Methanesulfonic acid, trifluoro-, lithium salt (8CI, 9CI) (CA INDEX NAME)



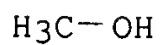
● Li

RN 90076-65-6 HCPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (9CI) (CA INDEX NAME.)

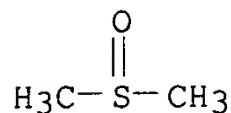


● Li

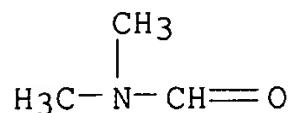
IT 67-56-1, Methanol, uses 67-68-5, Dimethylsulfoxide, uses 68-12-2, N,N-Dimethylformamide, uses 110-86-1, Pyridine, uses 680-31-9, Hexamethylphosphoramide, uses  
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
 (liquid electrolyte lithium-sulfur batteries)  
 RN 67-56-1 HCPLUS  
 CN Methanol (8CI, 9CI) (CA INDEX NAME)



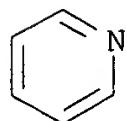
RN 67-68-5 HCAPLUS  
 CN Methane, sulfinylbis- (9CI) (CA INDEX NAME)



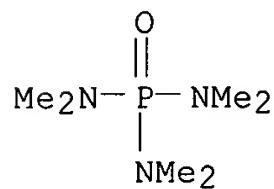
RN 68-12-2 HCAPLUS  
 CN Formamide, N,N-dimethyl- (8CI, 9CI) (CA INDEX NAME)



RN 110-86-1 HCAPLUS  
 CN Pyridine (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



RN 680-31-9 HCAPLUS  
 CN Phosphoric triamide, hexamethyl- (6CI, 8CI, 9CI) (CA INDEX NAME)



## RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Chu, M	1996			US 5523179 A	H CAPLUS
Du Pont	1970			FR 2014610 A	H CAPLUS
Du Pont	1972			FR 2124388 A	H CAPLUS
Lauck, H	1975			US 3907591 A	H CAPLUS
Peled, E	1989	126	269	Journal of Power Sou	
Tobishima, S	1997	142	1019	Electrochimica Acta	H CAPLUS
Univ Ramot	1982			GB 2084391 A	H CAPLUS

L31 ANSWER 11 OF 28 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1997:203971 HCAPLUS

DN 126:201656

TI Secondary nonaqueous electrolyte batteries and manufacture of anodes for the batteries

IN Ito, Shuji; Murata, Toshihide; Hasegawa, Masaki; Mifuji, Yasuhiko; Toyoguchi, Yoshinori

PA Matsushita Electric Ind Co Ltd, Japan

SO Jpn. Kokai Tokkyo Koho, 27 pp.  
CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

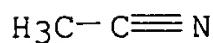
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 09027317 US 5629109	A2 A	19970128 19970513	JP 1995-158232 US 1995-492681	19950623 <-- 19950620 <--
PRAI	JP 1994-142936 JP 1995-112164	A A	19940624 19950510	<-- <--	

AB The batteries use anodes composed of a carbonaceous material containing S 7-35, O 6.5-25, and/or N 10.5-18.3%. The anodes are prepared by using the above carbonaceous material obtained by heat treating a mixture of an org compound containing S, O, and/or N and a metal halide or a halogen at 500-1400° in an inert atmospheric

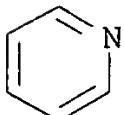
IT 75-05-8, Acetonitrile, processes 110-86-1, Pyridine, 2nd  
processes  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(in manufacture of nitrogen containing carbonaceous materials for secondary  
nonaq. battery anodes)

RN 75-05-8 HCPLUS

CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



RN 110-86-1 HCPLUS  
CN Pyridine (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

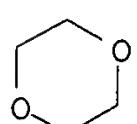


IT 123-91-1, 1,4-Dioxane, processes

RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(in manufacture of oxygen containing carbonaceous materials for secondary  
nonaq.  
battery anodes)

RN 123-91-1 HCPLUS

CN 1,4-Dioxane (9CI) (CA INDEX NAME)



IT 7439-93-2, Lithium, uses

RL: DEV (Device component use); USES (Uses)  
(manufacture of sulfur and oxygen and nitrogen containing carbonaceous  
materials  
for lithium intercalating anodes for batteries)

RN 7439-93-2 HCPLUS

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 7704-34-9, Sulfur, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (manufacture of sulfur and oxygen and nitrogen containing carbonaceous materials  
 for secondary nonaq. battery anodes)  
 RN 7704-34-9 HCPLUS  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

L31 ANSWER 24 OF 28 HCPLUS COPYRIGHT 2006 ACS on STN  
 AN 1982:500657 HCPLUS  
 DN 97:100657  
 TI Primary battery  
 IN Peled, Emanuel; Yamin, Hertzel  
 PA Ramot University Authority for Applied Research and Industrial Development  
 Ltd., Israel  
 SO Fr. Demande, 19 pp.  
 CODEN: FRXXBL  
 DT Patent  
 LA French  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	FR 2490881	A1	19820326	FR 1981-17647	19810918 <--
	FR 2490881	B1	19850802		
	IL 61085	A1	19830731	IL 1980-61085	19800919 <--
	DE 3136820	A1	19820616	DE 1981-3136820	19810916 <--
	DE 3136820	C2	19910221		
	GB 2084391	A	19820407	GB 1981-28173	19810917 <--
	GB 2084391	B2	19840516		
	US 4410609	A	19831018	US 1981-303020	19810917 <--
	JP 57145272	A2	19820908	JP 1981-147687	19810918 <--
PRAI	IL 1980-61085	A	19800919 <--		
AB	This high-energy-d. primary battery is based on a Li, Na or alloy dischargeable anode, a porous inert current collector, and a solvent in which polysulfide and an electrolyte are dissolved. Preferably, the solvent produces a limited dissoln. of the polysulfide. For example, a button cell is described with a volume of 6 cm <sup>3</sup> (5.2 + 2.3 + 0.5 cm). The polysulfide solution is prepared by mixing a predetd. quantity of Li with S dissolved in THF, for 50 h. The composition of the solution is 1.2M Li <sub>2</sub> S <sub>7.5</sub> . LiBr, dried under vacuum, is added to this solution to obtain a 1M solution. The cathodic current collector is made of C bonded to Teflon, supported on Ni. It is charged with 1.6 g of S. A porous polypropylene separator is inserted between the electrodes. The total capacity of the battery is 4A-h. The initial open-circuit potential is .apprx.2.35 V. The battery was maintained in service for >2 mo and furnished >3A-h up to a cutoff potential of 1.5 V, i.e. the consumption of S was >75%. The bulk energy d. of this battery, based on its inner volume, is 1.05 W-h/cm <sup>3</sup> .				
IT	7704-34-9, uses and miscellaneous				

RL: USES (Uses)  
 (battery, primary with lithium)

RN 7704-34-9 HCPLUS  
 CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

IT 7439-93-2, uses and miscellaneous

RL: USES (Uses)  
 (battery, primary, with sulfur)

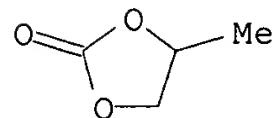
RN 7439-93-2 HCPLUS  
 CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 108-32-7 108-88-3, uses and miscellaneous

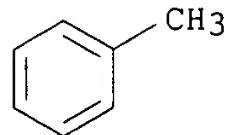
RL: PRP (Properties)  
 (in primary lithium-sulfur battery)

RN 108-32-7 HCPLUS  
 CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



RN 108-88-3 HCPLUS

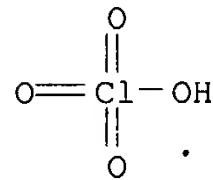
CN Benzene, methyl- (9CI) (CA INDEX NAME)



IT 7791-03-9

RL: PRP (Properties)  
 (primary battery electrolyte containing lithium polysulfide and)

RN 7791-03-9 HCPLUS  
 CN Perchloric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



● Li

=> d his

(FILE 'HOME' ENTERED AT 14:29:29 ON 06 DEC 2006)  
SET COST OFF

FILE 'HCAPLUS' ENTERED AT 14:29:40 ON 06 DEC 2006  
L1 1 S US20020102466/PN OR (US2001-910952# OR KR2000-42737 OR KR2000  
SEL RN

FILE 'REGISTRY' ENTERED AT 14:45:18 ON 06 DEC 2006  
L2 47 S E1-E47  
L3 6 S L2 AND LI/ELS  
L4 1 S LITHIUM/CN  
L5 6 S LI/MF NOT MASS  
L6 12 S L3-L5  
L7 1 S SULFUR/CN  
L8 26 S S/MF NOT MASS  
L9 21 S L8 NOT (34S2 OR E35S2 OR 37S2 OR 33S2 OR MNS/CI)  
L10 21 S L7,L9  
L11 11 S 680-31-9 OR 96-48-0 OR 67-63-0 OR 67-56-1 OR 64-17-5 OR 96-49  
L12 12 S 623-53-0 OR 462-06-6 OR 25496-08-6 OR 78-93-3 OR 110-86-1 OR  
L13 48 S C7H7F/MF AND 46.150.18/RID  
L14 5 S L13 NOT (11C# OR 13C# OR 14C# OR C11# OR C13# OR C14# OR (D O  
L15 16 S L12,L14

FILE 'HCAPLUS' ENTERED AT 14:54:43 ON 06 DEC 2006  
L16 104669 S L6  
L17 3423 S L10 AND L16  
L18 164 S L17 AND L11  
L19 58 S L18 AND L15  
L20 36 S L19 AND (PY<=2001 OR PRY<=2001 OR AY<=2001)  
L21 31 S L19 AND (PY<=2000 OR PRY<=2000 OR AY<=2000)  
L22 5 S L20 NOT L21  
SEL AN DN 1 2 5  
L23 2 S L22 NOT E48-E56  
L24 28 S L21 AND (PD<=20000725 OR PRD<=20000725 OR AD<=20000725)  
L25 3 S L21 NOT L24  
L26 33 S L23-L25  
L27 33 S L1,L26  
L28 5 S L27 AND (HWANG? OR CHOI? OR LEE? OR JUNG? OR KIM?) /AU  
L29 5 S L27 AND SAMSUN?/PA,CS  
L30 5 S L28,L29  
L31 28 S L27 NOT L30

FILE 'HCAPLUS' ENTERED AT 15:27:55 ON 06 DEC 2006

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